



[7590-01-P]

NUCLEAR REGULATORY COMMISSION

[NRC-2011-0278; Docket No.: 50-286]

Entergy Nuclear Indian Point 3, LLC.; Entergy Nuclear Operations, Inc.,

Indian Point Nuclear Generating Unit 3,

Exemption

1.0 Background

Entergy Nuclear Operations, Inc. (Entergy or the licensee) is the holder of Facility Operating License No. DPR-64, which authorizes operation of Indian Point Nuclear Generating Unit 3 (IP3). The license provides, among other things, that the facility is subject to all rules, regulations, and orders of the U.S. Nuclear Regulatory Commission (NRC or the Commission) now or hereafter in effect.

IP3 is a pressurized-water reactor located approximately 24 miles north of the New York City boundary line on the east bank of the Hudson River in Westchester County, New York.

2.0 Request/Action

Title 10 of the *Code of Federal Regulations* (10 CFR) 50.48(b), requires that nuclear power plants that were licensed to operate before January 1, 1979, satisfy the requirements of 10 CFR Part 50, Appendix R, "Fire Protection Program for Nuclear Power Facilities Operating Prior to January 1, 1979," Section III.G, "Fire protection of safe shutdown capability." The circuit separation and protection requirements being addressed in this request for exemption are specified in Section III.G.2. Since IP3 was licensed to operate before January 1, 1979, IP3 is required to meet Section III.G.2 of Appendix R to 10 CFR Part 50.

The underlying purpose of Section III.G of Appendix R to 10 CFR Part 50 is to establish reasonable assurance that safe shutdown (SSD) of the reactor can be achieved and maintained in the event of a postulated fire in any plant area. Circuits which could cause maloperation or prevent operation of redundant trains of equipment required to achieve and maintain hot shutdown conditions as a result of fire in a single fire area must be protected in accordance with III.G.2. If conformance with the technical requirements of III.G.2 cannot be assured in a specific fire area, an alternative or dedicated shutdown capability must be provided in accordance with Section III.G.3, or an exemption obtained in accordance with 10 CFR 50.12, "Specific exemptions."

By letter dated March 6, 2009, Entergy requested an exemption from the requirements of 10 CFR Part 50, Appendix R in accordance with 10 CFR 50.12. Specifically, Entergy requested an exemption to allow the use of Operator Manual Actions (OMAs) in lieu of meeting certain technical requirements of III.G.2 in Fire Areas AFW-6, ETN-4{1}, ETN-4{3}, PAB-2{3}, PAB-2{5}, TBL-5, and YARD-7. The table below provides the dates and topics of the submittals related to this request.

Subject	Author	Date	Description	ADAMS Accession
Exemption Request from Appendix R	Entergy	March 6, 2009	Original Submittal	ML090760993
Revised Exemption Request	Entergy	October 1, 2009	Revision to March 2009, submittal, incorporated changes to Attachment 2, <i>Technical Basis in Support of Exemption Request</i>	ML092810230
Request for Additional Information (RAI) #1	NRC	January 20, 2010	Request for information on the overall defense-in-depth for each fire zone	ML100150128
RAI Response #1	Entergy	May 4, 2010	Response to the staff's January 20, 2010, RAI.	ML101320263

RAI #2	NRC	August 11, 2010	RAI on reactor coolant system makeup, separation distances, etc.	ML102180331
RAI Response #2	Entergy	September 29, 2010	Response to the staff's August 11, 2010, RAI.	ML102930234
RAI #3	NRC	December 16, 2010	RAI on reactor coolant system makeup	ML103500204
RAI Response #3	Entergy	January 19, 2011	Responses to the staff's December 16, 2010, RAI.	ML110310242
Letter to revise previously submitted information	Entergy	February 10, 2011	Letter updating tables contained in previous submittals.	ML110540322
Letter to revise previously submitted information	Entergy	May 26, 2011	Letter updating tables contained in previous submittals.	ML11158A196

III.G.2 establishes various protection options for providing reasonable assurance that at least one train of systems, equipment and cabling required to achieve and maintain hot shutdown conditions remains free of fire damage. In lieu of providing one of the means specified in the regulation, Entergy requests an exemption from III.G.2 to allow the use of OMAs to achieve and maintain hot shutdown conditions in the event of fire in seven fire areas at IP3; specifically, Fire Areas AFW-6, ETN-4{1}, ETN-4{3}, PAB-2{3}, PAB-2{5}, TBL-5, and YARD-7.

3.0 Discussion

Pursuant to 10 CFR 50.12, the Commission may, upon application by any interested person or upon its own initiative, grant exemptions from the requirements of 10 CFR Part 50 when: (1) the exemptions are authorized by law, will not present an undue risk to public health or safety, and are consistent with the common defense and security; and (2) when special circumstances are present. The licensee stated that special circumstances exist because the application of the regulation in this particular circumstance is not necessary to achieve the underlying purpose of the rule.

In accordance with 10 CFR 50.48(b), nuclear power plants licensed to operate before January 1, 1979, are required to meet Section III.G, of 10 CFR Part 50, Appendix R. The underlying purpose of Section III.G of 10 CFR Part 50, Appendix R, is to ensure that the ability to achieve and maintain SSD is preserved following a fire event. The regulation intends for licensees to accomplish this by extending the concept of defense-in-depth to:

- Prevent fires from starting.
- Rapidly detect, control, and extinguish promptly those fires that do occur.
- Provide protection for structures, systems, and components important to safety so that a fire that is not promptly extinguished by the fire suppression activities will not prevent the SSD of the plant.

III.G.2 requires one of the following means to ensure that a redundant train of SSD cables and equipment is free of fire damage, where redundant trains are located in the same fire area outside of primary containment:

- a. Separation of cables and equipment by a fire barrier having a 3-hour rating;
- b. Separation of cables and equipment by a horizontal distance of more than 20 feet with no intervening combustibles or fire hazards and with fire detectors and an automatic fire suppression system installed in the fire area; or
- c. Enclosure of cables and equipment of one redundant train in a fire barrier having a 1-hour rating and with fire detectors and an automatic fire suppression system installed in the fire area.

In its March 6, 2009, and October 1, 2009, submittals, Entergy requested an exemption from certain technical requirements of III.G.2 to the extent that one of the redundant trains of systems necessary to achieve and maintain hot shutdown is not maintained free of fire damage in accordance with one of the required means prescribed in III.G.2 in Fire Areas AFW-6, ETN-4{1}, ETN-4{3}, PAB-2{3}, PAB-2{5}, TBL-5, and YARD-7.

Each OMA included in this review consists of a sequence of tasks that occur in various fire areas. The OMAs are initiated upon confirmation of a fire in a particular fire area, which the licensee has further subdivided into fire zones. Listed in the order of the fire area of fire origin, the OMAs included in this review are as follows:

OMA #	Area of Fire Origin	Area Name	Fire Zone Crediting the OMA	Operator Manual Actions
1	AFW-6	Auxiliary Feedwater (AFW) Pump Room	23	Locally start 33 AFW Pump via operation of the Bus 6A circuit breaker.
2	ETN-4{1}	Entrance to Electrical Tunnels	7A	Swap 32 Component Cooling Water (CCW) pump to alternate power supply or align city water to charging pumps.
3			7A	Operate 480V Bus 3A breaker locally to start 31 AFW pump.
4			7A	Locally operate the bypass valve for Flow Control Valve (FCV)-1121 in support of use of 31 AFW pump.
5			60A	Operate HCV-1118 manually to control 32 AFW pump.
6			7A, 60A	Align Appendix R Diesel Generator (ARDG) to 480 V Buses 2A, 3A, 5A, and 312.
7			7A, 60A	Swap 31 or 32 charging pump to alternate power supply.
8			7A, 60A	Locally operate FCV-405B, FCV-405D, or FCV-406B to control AFW flow to Steam Generators (SGs).
9			60A	Locally open valve 227 to establish charging [previously "CVCS"] makeup flowpath to Reactor Coolant System (RCS).
10			60A	Locally close Level Control Valve (LCV)-112C and open valve 288 to align charging pump suction to the Refueling Water Storage Tank (RWST).
11			60A	Locally operate Pressure Control Valve (PCV)-1139 to ensure steam supply to 32 AFW pump.
12			60A	Locally operate PCV-1310A and PCV-1310B to ensure steam supply to 32 AFW pump.
13			60A	Locally manually perform Service Water (SW) pump strainer backwash as required.
14	ETN-4{3}	Electrical Tunnel	73A	Operate HCV-1118 manually to control 32 AFW pump.
15			73A	Locally operate PCV-1139 to ensure steam supply to 32 AFW pump.

OMA #	Area of Fire Origin	Area Name	Fire Zone Crediting the OMA	Operator Manual Actions
16			73A	Locally operate 32 PCV-1310A, PCV-1310B to ensure steam supply to 32 AFW pump.
17			73A	Locally operate FCV-405C and FCV-405D to control AFW flow to SG.
18	PAB-2{3}	Primary Auxiliary Building; Charging Pump Rooms	6	Locally close valve LCV-112C and open valve 228 to align charging pump suction path to RWST.
19	PAB-2{5}	Primary Auxiliary Building	17A, 19A, 58A	Locally close supply breaker for 32 Charging Pump [previously "CVCS"] Pump.
20			17A, 19A, 58A	Locally control 32 charging [previously "CVCS"] pump using scoop tube positioner.
21			59A	Open bypass valve 227 to establish charging flowpath to RCS around potentially failed closed HCV-142.
22			17A, 20A, 27A, 30A	Locally close LCV-112C and open bypass valve 288 to establish flowpath from RWST to charging pump suction.
23	TBL-5	Turbine Building and the AFW Pump Building	52A	Locally operate [bypass valve for] FCV-1121 AFW pump recirculation valve during pump startup.
24			52A, 54A	Locally operate FCV- 406A and FCV-406B to control AFW flow to SGs.
25			37A, 38A, 43A, 44A	Locally/manually backwash SW pump strainer as required if power to strainer associated with selected SW pump is lost (use one of STR PMP-31 through STR PMP-36).
26	YARD-7	External Yard Areas Intake Structure	22	Locally start ARDG to supply Motor Control Center (MCC) 312A in support of the use of SW pump 38.
27			22, 222	Locally/manually backwash SW Pump strainer as required if power to strainer associated with selected SW pump is lost.

In their submittals, the licensee described elements of their fire protection program that provide their justification that the concept of defense-in-depth that is in place in the above fire areas is consistent with that intended by the regulation. To accomplish this, the licensee utilizes various protective measures to accomplish the concept of defense-in-depth. Specifically, the licensee stated that the purpose of their request was to credit the use of OMAs, in conjunction

with other defense-in-depth features, in lieu of the separation and protective measures required by III.G.2 for a fire in the fire areas stated above.

In their March 6, 2009, and October 1, 2009, submittals, the licensee provided an analysis that described how fire prevention is addressed for each of the fire areas for which the OMAs may be required because the separation requirements for equipment and electrical circuits required by III.G.2 are not met. Specifically, the licensee stated that noncombustible materials have been used to the maximum extent practicable and that the introduction of combustible materials into areas with safety-related equipment, including Fire Areas AFW-6, ETN-4{1}, ETN-4{3}, PAB-2{3}, and PAB-2{5} is strictly controlled by administrative procedures. The administrative procedures govern the handling, storage, and limitations for use of ordinary combustible materials, combustible and flammable gases and liquids, and other combustible supplies. In addition, the licensee stated that with the exception of Fire Areas TBL-5 and YARD-7, all of the fire areas identified in the licensee's request are subject to the Indian Point Energy Center Transient Combustible Control Program, as implemented via procedure EN-DC-161, "Control of Combustibles," and are controlled as Level 2 combustible control areas. The licensee also stated that Fire Area TBL-5, consisting of the Turbine Building and certain adjacent fire zones, does not contain safety-related structures, systems or components (SSCs) and is not subject to the explicit transient combustible controls of EN-DC-161 but that procedure OAP-017, "Plant Surveillance and Operator Rounds" includes inspection guidelines for operator rounds, which include monitoring for general area cleanliness, and for any housekeeping problems that may present a fire or safety concern. Consequently, operator rounds performed each shift provide for the monitoring of Area TBL-5 and other plant areas for accumulations of combustibles that could present an unacceptable fire safety challenge. Similarly, procedure ENMA-132, "Housekeeping" includes guidance for monitoring general area cleanliness as well as monitoring for accumulations of combustibles. The licensee stated that the administrative

controls are described in the IP3 Fire Protection Program (FPP), which is incorporated by reference into the Updated Final Safety Analysis Report.

The licensee stated that both thermoplastic and thermoset low-voltage power, control, and instrument cables are installed at IP3. Since the thermoplastic insulated cables were manufactured and installed prior to the issuance of IEEE-383, a standard for nuclear plant cables, they were not qualified to that standard. In its May 4, 2010 letter, the licensee stated that the non-IEEE-383-qualified cables are constructed with an asbestos glass braid outer jacket which provides protection from flame spread. In addition, the licensee stated that the results of various tests, as well as an actual fire event at Indian Point Nuclear Generating Unit 2 (IP2) during plant construction, have demonstrated the ability of this type of thermoplastic insulated cables to minimize the growth and spread of cable fires. The licensee also stated that the likelihood of self-ignited cable fires is minimized by appropriately sized electrical protection devices (e.g., fuses and circuit breakers).

All of the fire areas in the plant are comprised of one or more fire zones consisting of separate compartments or fire zone delineations based on spatial separation. In addition, the licensee stated that the localization of hazards and combustibles within each fire zone, combined with the spatial or physical barrier separation between zones, provides reasonable assurance that a fire that occurs within a particular zone will be confined to that zone. As such, the licensee provided a characterization of the defense-in-depth that is present in each of the fire zones containing multiple trains of SSD equipment. The licensee further stated that for each of the fire zones where OMAs are performed, the adequacy of non-rated fire barriers was evaluated to ensure that they can withstand the hazards associated with the area. Therefore, this review evaluates the defense-in-depth provided in each of the zones of concern.

In its submittals, the licensee provided a summary of plant-specific fire protection features provided for each fire zone identified in its request including an account of combustible

loading (both fixed and transient), ignition sources, detection, suppression, administrative controls, and identified any additional fire protection features that may be unique to the fire zone, such as electrical raceway fire barriers. In its responses, the licensee stated that combustibles and sources of ignition are tightly controlled by administrative controls programs and that the areas included in this exemption are not shop areas so hot work activities (such as welding) are infrequent and appropriate administrative controls (e.g., hot work permits, fire watch, and supervisory controls) are in place if hot work activities do occur. The licensee also stated that the original installation of the suppression and detection systems was accepted by the NRC staff in safety evaluation reports (SERs) dated March 6, 1979, and a supplement dated May 2, 1980, and that there are no code compliance items that present an adverse impact to the implementation of the requested OMAs. Within the fire zones of concern to its request, the licensee stated that non-rated fire barrier assemblies are only used or credited in Fire Area AFW-6 (Fire Zone 23), Fire Area ETN-4 (Fire Zones 7A and 60A), and Fire Area PAB-2 (Fire Zone 27A) and that in each case, the fire resistive capability of the barrier was evaluated and found to be acceptable given other features and circumstances present in those zones.

Entergy stated that for each of the fire areas addressed in this evaluation, Post-Fire Safe Shutdown (PFSSD) is principally accomplished by remaining in the Central Control Room (CCR) and conducting a normal (non-alternative) shutdown. In all cases, the identified OMAs mitigate conditions where certain technical requirements of III.G.2 are not satisfied.

Entergy further stated that the OMAs required for achieving and maintaining hot shutdown conditions are feasible, reliable, and are not impacted by environmental conditions (radiation, lighting, temperature, humidity, smoke, toxic gas, noise, fire suppression discharge, etc.) associated with fires in III.G.2 areas. The feasibility and reliability of the requested OMAs is addressed in Section 4.0 of this evaluation.

NRC Staff Observations

In its May 4, 2010 response to RAI-07.1, the licensee stated that no credit was taken for immediate and proactive OMA response by plant operators upon the receipt of a fire detection alarm in any of the identified fire zones. Instead, the licensee stated that OMAs are initiated upon the detection of operating abnormalities or failures caused by a postulated fire event. In this same response, the licensee stated that they conducted exercises using the plant simulator to evaluate the feasibility of the OMAs where a fire condition or a spontaneous reactor trip caused by a fire was announced at the outset of the simulation followed by the failure of discrete components that are subject to impairment due to fire damage to cables or components resulting from a fire in the area of concern. For fires originating in fire zones lacking fire detection and/or automatic fire suppression systems, the NRC staff considers it improbable that the operators would properly identify that the indications were the result of a fire instead of some other fault. In addition, the operators would be delayed in positively identifying the location of the fire based on these indirect and ambiguous indicators. Therefore, for some scenarios involving fire zones that lack fire detection systems, operators are unlikely to identify and respond to a fire event in a manner that prompts them to perform certain OMAs prior to a significant degradation of the plant's condition. This becomes especially relevant for OMAs that are required to be completed within a relatively short period of time, e.g., within about 30 minutes, or have limited margins available to complete the required actions.

For OMAs that are required to be completed within a short period of time, the NRC staff evaluates if operators can reliably perform the OMA. In order to be able to perform OMAs reliably, it is important that operators are able to promptly implement any required action based on clear indications. Indirect indicators and diagnostic analysis would result in delayed action to initiate the appropriate OMAs and would impair their reliable completion. For example, loss of control or indication for a pump or other affected component could result from the power supply

circuit breaker opening due to an electrical fault other than a fire, and the operator might delay taking actions for a fire while investigating other potential and more-likely causes. The NRC staff documented a position on procedures and training for such actions in Section 4.2.9 of NUREG-1852, "Demonstrating the Feasibility and Reliability of Operator Manual Actions in Response to Fire," which notes that the procedures for reactive actions should clearly describe the indications which prompt initiation of the actions. Therefore, where OMAs need to be performed within a short period of time, fire zones crediting those OMAs are expected to have more robust defense-in-depth and clear, direct procedures than fire zones that have a significant margin in their OMA performance times.

In the August 11, 2010 RAI-02.1, and the December 16, 2010 RAI-01.1, the NRC staff requested the licensee to describe the spatial separation between redundant trains of equipment. However, the licensee's response only provided information regarding the separation between ignition sources and safe shutdown equipment and not information regarding the separation between redundant trains of equipment within the area. For example, in its response to RAI-01.1 dated January 19, 2011, the licensee stated that "With respect to Item 3 above, Entergy has provided cable routing dimensional details for the circuits of concern in the submittal dated September 29, 2010. However, it should be noted that in most cases, the dimensional data provided does not relate to the separation between redundant trains, but rather the location and separation from ignition sources for a single train that presents the potential for use of the credited OMA if that train is impacted by fire damage." During a clarification call with the licensee, the licensee did not provide any dimensional data on train separation. Without dimensional data on train separation, the staff has conservatively assumed that there is no discernable separation between redundant trains of equipment.

In addition, the licensee noted that the introduction of combustible materials into most areas included in its request was limited via administrative procedures such as EN-DC-161.

The licensee stated that since Fire Area TBL-5 did not contain safety-related systems or components, it was not addressed by this procedure. The NRC staff notes that the licensee requested OMAs for Fire Area TBL-5 area and that alternate shutdown equipment and several cables associated with normal safe-shutdown equipment are located in this area. The licensee stated that operator rounds are performed each shift in Fire Area TBL-5 that would monitor the presence of combustibles that could present an unacceptable fire safety challenge. In addition, the licensee stated that procedures OAP-017 (Plant Surveillance and Operator Rounds) and EN-MA-132 (Housekeeping) include guidance for monitoring general area cleanliness including monitoring for accumulations of combustibles. The NRC staff notes that the combustible material controls procedures for this fire area are not as robust as for safety-related areas, and therefore results in a reduction in the defense-in-depth for the impacted fire zones.

Specific Area or Zone Discussion

Each of the fire areas or zones included in this exemption is analyzed below with regard to how the concept of defense-in-depth is achieved for each area or zone and the role of the OMAs in the overall level of safety provided for each area or zone.

3.1 Fire Area AFW-6 – Auxiliary Boiler Feed Pump Room, Elevation 18'-6" of the Auxiliary Feed Pump Building (Fire Zone 23 - Auxiliary Boiler Feed Pump (ABFP) Room, Elevation 18'-6")

3.1.1 Fire Prevention

Fire Area AFW-6 consists of a single room (the ABFP Room or the Auxiliary Feedwater (AFW) Pump Room) and is designated as Fire Zone 23. Note that the pumps which supply water to the steam generators following a reactor trip are generically known as AFW pumps, but at IP3 they are also called Auxiliary Boiler Feed Pumps. The licensee stated that the fire loading in this area is low and that fixed combustibles consist of cable insulation, small quantities of lube oil, electrical panels, and incident materials and Class A combustibles. The

licensee also stated that the ignition sources in the area consist of cable runs, junction boxes, motors, pumps, and an electrical cabinet.

3.1.2 Detection, Control, and Extinguishment

The licensee stated that Fire Zone 23 has an automatic, ionization smoke detection system throughout the zone that is designed and installed in accordance with National Fire Protection Association (NFPA) standard NFPA 72E – 1974 edition. The licensee also stated that Fire Zone 23 has an automatic, wet-pipe fire suppression system throughout the zone that is designed and installed in accordance with NFPA 13 – 1983 Edition.

3.1.3 Preservation of Safe Shutdown Capability

The licensee stated that Fire Zone 23 has a ceiling height of approximately 13'-0" and an approximate floor area of 1,254 square feet. This fire zone contains the three AFW pumps (31, 32, and 33) and their discharge valves used to supply water to the steam generators for reactor coolant system decay heat removal when the normal feedwater system is not available, such as following a reactor trip. As discussed in Section 3.0 above, the licensee did not identify any separation between credited and redundant trains of equipment.

3.1.4 OMAs Credited for a Fire in Fire Area AFW-6 (Fire Zone 23)

3.1.4.1 OMA #1 – Locally start 33 AFW pump via operation of the Bus 6A circuit breaker.

The licensee stated that cables AK3-PT2 and JB1-PT2/2 for the 33 AFW pump are located in Fire Zone 23 in rigid steel conduit located 6.3 to 12 feet above the floor and terminating in the AFW pump control panel. In addition, the licensee stated that ignition sources in the zone located less than 20 feet horizontally from cables AK3-PT2 and JB1-PT2/2 consist of an electrical cabinet separated from the cable by approximately 12.4 feet horizontally and that there are no intervening combustibles.

The licensee also stated that cable JB1-X32/2, also for the 33 AFW pump, is located in Fire Zone 23 in rigid steel conduit that runs vertically from a junction box on the north wall for

approximately 5.5 feet and then horizontally in a tray located approximately 10.8 ft above the floor, before exiting the zone through the ceiling. In addition, the licensee stated that ignition sources in the zone located less than 20 feet horizontally from cable JB1-X32/2 consist of an AFW pump motor and two electrical cabinets. According to the licensee, the AFW pump motor is separated from the cable by approximately 8.2 feet horizontally, one electrical cabinet is located approximately 5.7 feet directly below the cable, and the other electrical cabinet is separated from the cable by approximately 9.8 feet horizontally. The licensee also stated that there are no intervening combustibles.

The licensee also stated that cables LL7-X32, LQ7-X32, and X32-Y2J, also for the 33 AFW pump, are located in Fire Zone 23 in rigid steel conduit that runs from flow transmitters FC-1136S and FC-1136A-S located approximately 4.4 feet above the floor along the north wall terminating at a junction box located approximately 5 feet above the floor. In addition, the licensee stated that ignition sources in the zone located less than 20 feet horizontally from cables LL7-X32, LQ7-X32, and X32-Y2J consist of two AFW pump motors, which are separated from the cables by approximately 7 feet horizontally and that there are no intervening combustibles.

In the event that a fire occurs and a failure of the CCR control switch response or pump indication prompts operator action to investigate the breaker status at the switchgear, the licensee stated that OMA #1 is available to restore this function by starting the 33 AFW pump via local operation of the circuit breaker on Bus 6A, which is located in a different fire area. If OMA #1 becomes necessary, the licensee stated that they have assumed a 4.5 minute diagnosis period and that the required time to perform the action is 13 minutes while the time available is 30 minutes, which provides 12.5 minutes of margin.

3.1.5 Conclusion for Fire Area AFW-6 (Fire Zone 23)

The NRC staff had previously issued an exemption from III.G.2 for Fire Zone 23 in 1987 (ML003779008). In that exemption, the NRC staff found that the low fire load, the fire detection system, the automatic fire suppression system, and the distance between AFW pumps would provide reasonable assurance that one train of shutdown equipment would be available following a fire in this fire zone, including the use of OMA #1. The NRC staff concludes that OMA #1 remains acceptable for maintaining the reactor coolant system heat removal function and that the III.G.2 exemption for Fire Zone 23 remains valid.

3.2 Fire Area ETN-4{1} – Electrical Tunnels (Fire Zone 7A – Lower Electrical Tunnel, Elevation 33'-0")

3.2.1 Fire Prevention

The licensee stated that the fire loading in this area is low and that the fixed combustibles are cable insulation and incidental materials, and that there are no transient combustibles. The licensee also stated that the ignition sources in the area consist of cable runs.

3.2.2 Detection, Control, and Extinguishment

The licensee stated that Fire Zone 7A has an area-wide ionization smoke detection system installed as well as thermal detection in the cable trays and that the systems were designed and installed in accordance with NFPA 72E, 1974 Edition. The licensee also stated that Fire Zone 7A has a dry-pipe, preaction fire suppression sprinkler system installed in the cable trays that was designed and installed in accordance with NFPA 13, 1978 Edition and NFPA 15, 1977 Edition.

3.2.3 Preservation of Safe Shutdown Capability

The licensee stated that Fire Zone 7A has a ceiling height of approximately 16'-0" and an approximate floor area of 6,386 square feet. As discussed in Section 3.0 above, the licensee did not identify any separation between credited and redundant trains of equipment.

3.2.4 OMAs Credited for a Fire in Fire Area ETN-4{1} (Fire Zone 7A)

3.2.4.1 OMA #2 – Swap 32 Component Cooling Water (CCW) pump to alternate power supply or align city water to charging pumps.

The licensee stated that cable AS9-W1D for the 32 CCW pump is routed through Fire Zone 7A. The licensee also stated that there are no ignition sources, other than cables, located less than 20 feet horizontally from the cables. The licensee further stated that the postulated fire scenario would involve a transient combustible fire that causes a failure of the power cables to redundant CCW pumps 31 and 33.

In the event that a fire occurs and causes a loss of the CCR control or indication for all CCW pumps, the licensee stated that OMA #2 is available to restore this function by swapping the 32 CCW pump to its alternate power supply or aligning city water to cool the charging pumps. If OMA #2 becomes necessary, the licensee stated that they have assumed failure at the onset of the fire and that the required time to perform the action is 34 minutes while the time available is >60 minutes, which provides 26 minutes of margin.

3.2.4.2 OMA #3 – Operate 480V bus 3A breaker locally to start 31 AFW pump.

The licensee stated that cables A15-PT2, JB1 -PT2/1, JB1 -X32/1 for the 31 AFW pump are all routed through Fire Zone 7A. The licensee also stated that there are no ignition sources, other than cables, located less than 20 feet horizontally from the cables. The licensee further stated that the postulated fire scenario would involve a transient combustible fire that causes a failure of cables serving the 31 AFW pump.

In the event that a fire occurs and causes a loss of the CCR control or indication for the 31 AFW pump, the licensee stated that OMA #3 is available to restore this function by operating a 480V bus 3A breaker locally to start the 31 AFW pump. If OMA #3 becomes necessary, the licensee stated that they have assumed a 4.5 minute diagnosis period and that the required time to perform the action is 7 minutes while the time available is 30 minutes, which provides 18.5 minutes of margin.

3.2.4.3 OMA #4 – Locally operate FCV-1121 bypass valve in support of use of 31 AFW pump.

The licensee stated that cables A15-PT2, JB1 -PT2/1, JB1 -X32/1 for the 31 AFW pump, and cable JB1 -X32/1 for valve FCV-1121, which allows recirculation flow for the 31 AFW pump, are all routed through Fire Zone 7A. The licensee also stated that there are no ignition sources, other than cables, located less than 20 feet horizontally from the cables. The licensee further stated that the postulated fire scenario would involve a transient combustible fire that causes a failure of cables serving valve FCV-1121.

In the event that a fire occurs and causes a loss of the CCR control or indication for all AFW pumps, the licensee stated that OMA #4 is available to restore recirculation flow by locally operating the bypass valve for FCV-1121 to support the use of the 31 AFW pump. If OMA #4 becomes necessary, the licensee stated that they have assumed a 4.5 minute diagnosis period and that the required time to perform the action is 7 minutes while the time available is 30 minutes, which provides 18.5 minutes of margin.

3.2.4.4 OMA #6 – Align Appendix R Diesel Generator (ARDG) to 480 V buses 2A, 3A, 5A, and 312.

The licensee stated that in the event of a loss of offsite power, the use of the ARDG is credited for supplying power to the 480V buses in the event of a fire in Fire Area ETN-4{1}. In the event that a fire occurs and causes a loss of the CCR control or indication for the buses, the licensee stated that OMA #6 is available to align the ARDG to 480V buses 2A, 3A, 5A, and 312.

If OMA #6 becomes necessary, the licensee stated that they have assumed a loss of offsite power at the outset of the event and that the required time to perform the action is 50 minutes while the time available is 75 minutes, which provides 25 minutes of margin. The NRC staff notes that this is equivalent to implementing an alternate safe shutdown system in accordance with III.G.3 and does not qualify for a III.G.2 exemption as requested by the licensee.

3.2.4.5 OMA #7 – Swap 31 or 32 charging pump to alternate power supply.

The licensee stated that cables AH9-K1 B, AH9-PL2, and JA4-PL2/2 for the 32 charging pump are all routed through Fire Zone 7A. The licensee also stated that there are no ignition sources, other than cables, located less than 20 feet horizontally from the cables. The licensee further stated that the postulated fire scenario would involve a transient combustible fire that causes a failure of cables serving charging pumps 31 and 32.

In the event that a fire occurs and causes a loss of the CCR control or indication for all charging pumps, the licensee stated that OMA #7 is available to restore this function by swapping the 31 or 32 charging pump to its alternate power supply. If OMA #7 becomes necessary, the licensee stated that they have assumed a 30-minute diagnosis period and that the required time to perform the action is 8 minutes while the time available is 75 minutes, which provides 37 minutes of margin.

3.2.4.6 OMA #8 – Locally operate FCV-405B, FCV-405D, or FCV-406B to control AFW flow to steam generators.

The licensee stated that cables JB1-SX1/1, JF5-KV4, JF5-LL8, K45-YM3, and K47-YM3 for valve FCV-406B, which controls the flow from the 32 AFW pump to the 34 steam generator (SG), are all routed through Fire Zone 7A. The licensee also stated that there are no ignition sources, other than cables, located less than 20 feet horizontally from the cables. The licensee further stated that the postulated fire scenario would involve a transient combustible fire that causes a failure of cables serving the AFW pumps and valves.

In the event that a fire occurs and causes a loss of the CCR control or indication for all AFW flow control valves, the licensee stated that OMA #8 is available to restore this function by locally operating FCV-405B, FCV-405D, or FCV-406B to control AFW flow to the steam generators. If OMA #8 becomes necessary, the licensee stated that they have assumed a 4.5-minute diagnosis period and that the required time to perform the action is 17 minutes while the time available is 30 minutes, which provides 8.5 minutes of margin.

3.2.5 Conclusion for Fire Area ETN-4{1} (Fire Zone 7A)

The NRC staff had previously issued exemptions for Fire Zone 7A in 1987 (ML003779008) and in 1984 (ML003779284). In those exemptions, the NRC staff found that the fire detection system, the automatic fire suppression system, and the distance between redundant trains would provide reasonable assurance that one train of shutdown equipment would be available following a fire in this fire zone. The NRC staff finds the defense-in-depth features in this fire zone and the available time margin would allow the use of OMAs #2, 3, 4, and 7. However, based on new information in the current submittal the NRC staff finds that OMA #6 is equivalent to implementing an alternate safe shutdown system in accordance with III.G.3 and does not qualify for a III.G.2 exemption as requested by the licensee. Also, OMA #8 has insufficient available time margin to allow for reliable performance considering the potential variables as discussed in NUREG-1852. Therefore, the NRC staff finds that an exemption from III.G.2 based on these OMAs cannot be granted for Fire Zone 7A.

3.3 Fire Area ETN-4{1} – Electrical Tunnels (Fire Zone 60A – Upper Electrical Tunnel, Elevation 43'-0")

3.3.1 Fire Prevention

The licensee stated that the fire loading in this area is low and that the fixed combustibles are cable and incidental materials and that there are no transient combustibles. The licensee also stated that the ignition sources in the area consist of cables.

3.3.2 Detection, Control, and Extinguishment

The licensee stated that Fire Zone 60A has an area-wide, automatic ionization smoke detection system installed that was designed and installed in accordance with NFPA 72E, 1974 Edition. The licensee also stated that Fire Zone 60A has a dry-pipe, preaction sprinkler fire suppression system installed in the cable trays that was designed and installed in accordance with NFPA 13, 1978 Edition and NFPA 15, 1977 Edition.

3.3.3 Preservation of Safe Shutdown Capability

The licensee stated that Fire Zone 60A has a ceiling height of approximately 10'-0" and an approximate floor area of 3,200 square feet. The licensee stated that cables and JB1-S99, JB1-X02, JB1-X02/1, and JB1-SZ6 for valves PCV-1310A and PCV-1310B (steam supply to the 32 AFW pump), DE1-XV2 for 38 SW strainer, JB1-TA5 for valve HCV-1118 (governor valve for the 32 AFW pump), AQ3-K1C, AQ3-PL2, JA2-PL2/1 for 31 charging pump, JB1-KV6 for valve FCV-405B (32 AFW pump to 32 SG), JB1-KV8 for valve FCV-405D (32 AFW pump to 34 SG), JB5-X1J for valve HCV-142 (charging pump discharge to RCS loops), DD4-JB5 for valve LCV-112C (volume control tank to charging pump suction), JB1 -PT2/3 for valve PCV-1139 (steam supply to the 32 AFW pump), JB1-SX1/1, JF5-KV4, K45-YM3, K47-YM3, and JF5-LL8 for valve FCV-406B (31 AFW pump to the 32 SG) are all routed through Fire Zone 60A. The licensee also stated that there are no ignition sources, other than cables, located less than 20 feet horizontally from the cables. The licensee further stated that no cables associated with the 31 AFW pump, its flow control valves (FCV-406A to 31 SG, FCV-406B to 32 SG), or its power source (Bus 3A) are routed through this fire area but that the protected instrumentation credited in this fire area for monitoring steam generator (SG) level is the instrumentation for the 33 SG and 34 SG, which would make the 31 AFW pump an unsuitable choice if all level instrumentation for 31 and 32 SG has been rendered inoperable by fire damage. The licensee also stated that the anticipated fire is a slow developing cable fire located in the cable trays.

The licensee also stated that Conduit 1VA/JA (source range flux N31 instrumentation) is protected with fire barrier wrap from penetration H-20 in Fire Zone 73A through the upper electrical tunnel. As discussed in Section 3.0 above, the licensee did not identify any separation between credited and redundant trains of equipment.

3.3.4 OMAs Credited for a Fire in Fire Area ETN-4{1} (Fire Zone 60A)

3.3.4.1 OMA #5 – Operate HCV-1118 manually to control 32 AFW pump.

In the event that a fire occurs and causes a loss of the CCR control or indication for all AFW pumps, the licensee stated that OMA #5 is available to restore this function by manually operating HCV-1118 to control the 32 AFW pump. If OMA #5 becomes necessary, the licensee stated that they have assumed a 4.5-minute diagnosis period following the failure and that the required time to perform the action is 17 minutes while the time available is 30 minutes, which provides 8.5 minutes of margin.

3.3.4.2 OMA #6 – Align Appendix R Diesel Generator to 480 V buses 2A, 3A, 5A, and 312.

The licensee stated that in the event of a loss of offsite power, the use of the ARDG is credited for supplying power to the 480V buses in the event of a fire in Fire Area ETN-4{1}. In the event that a fire occurs and causes a loss of the CCR control or indication for the buses, the licensee stated that OMA #6 is available to align the ARDG to 480V buses 2A, 3A, 5A, and 312. If OMA #6 becomes necessary, the licensee stated that they have assumed a loss of offsite power at the outset of the event and that the required time to perform the action is 50 minutes while the time available is 75 minutes, which provides 25 minutes of margin. The NRC staff notes that this is equivalent to implementing an alternate safe shutdown system in accordance with III.G.3 and does not qualify for a III.G.2 exemption as requested by the licensee.

3.3.4.3 OMA #7 – Swap 31 or 32 charging pump to alternate power supply.

In the event that a fire occurs and causes a loss of the CCR control or indication for all charging pumps, the licensee stated that OMA #7 is available to restore this function by

swapping the 31 or 32 charging pump to its alternate power supply. If OMA #7 becomes necessary, the licensee stated that they have assumed a 30-minute diagnosis period and that the required time to perform the action is 8 minutes while the time available is 75 minutes, which provides 37 minutes of margin.

3.3.4.4 OMA #8 – Locally operate FCV-405B, FCV-405D, or FCV-406B to control AFW flow to steam generators.

In the event that a fire occurs and causes a loss of the CCR control or indication for all AFW flow control valves, the licensee stated that OMA #8 is available to restore this function by locally operating FCV-405B, FCV-405D, or FCV-406B to control AFW flow to the SGs. If OMA #8 becomes necessary, the licensee stated that they have assumed a 4.5-minute diagnosis period and that the required time to perform the action is 17 minutes while the time available is 30 minutes, which provides 8.5 minutes of margin.

3.3.4.5 OMA #9 – Locally open valve 227 to establish charging makeup flowpath to RCS.

The licensee stated that OMA #9 is only required if normal flowpath valve HCV-142 fails closed and that spurious isolation of the charging makeup path to the RCS is identified in the CCR by operators confirming that a charging pump is in operation, but pressurizer level is decreasing, or pressurizer level channels are nonfunctional or erratic in operation. The licensee also stated that the anticipated fire is a slow developing cable fire located in the cable trays.

In the event that a fire occurs and causes the normal flowpath valve HCV-142 to close, the licensee stated that OMA #9 is available to restore this function by locally opening bypass valve 227 to establish the charging makeup flowpath to the RCS. If OMA #9 becomes necessary, the licensee stated that they have assumed a 60-minute period before re-entering the fire area, a 30-minute diagnosis period, which is assumed to transpire during the 60-minute waiting period and that the required time to perform the action is 9 minutes while the time available is 75 minutes, which provides 6 minutes of margin.

3.3.4.6 OMA #10 – Locally close valve LCV-112C and open valve 288 to align charging pump suction to RWST.

The licensee stated that preemptive steps in procedure 3-ONOP-FP-1, "Plant Fires," for a fire scenario will trigger action via 3-AOP-SSD-1, "Control Room Inaccessibility Safe Shutdown Control," to locally verify the charging pump suction path and perform the stated OMA prior to starting a charging pump. 3-AOP-CVCS-1, "Chemical And Volume Control System Malfunctions," provides guidance to be followed in the event that a swap of the charging pump suction to the RWST cannot be confirmed (i.e., loss of CCR indication for valves LCV-112C [volume control tank to charging pump suction] or LCV-112B [refueling water storage tank to charging pump suction]), which will also trigger the OMA. The licensee also stated that the anticipated fire is a slow developing cable fire located in the cable trays.

In the event that a fire occurs and causes a loss of the CCR control or indication for valves LCV-112C or LCV-112B, the licensee stated that OMA #10 is available to restore this function by locally closing valve LCV-112C and opening valve 288 to align the charging pump suction to the RWST. If OMA #10 becomes necessary, the licensee stated that they have assumed a 60-minute period before re-entering the fire area, a 30-minute diagnosis period, which is assumed to transpire during the 60-minute waiting period and that the required time to perform the action is 11 minutes while the time available is 75 minutes, which provides 4 minutes of margin.

3.3.4.7 OMA #11 – Locally operate PCV-1139 to ensure steam supply to 32 AFW pump.

The licensee stated that OMA #11 is only required if 32 AFW pump is selected as the credited pump and other OMAs related to the 31 AFW pump are unsuccessful. The licensee also stated that the anticipated fire is a slow developing cable fire located in the cable trays.

In the event that a fire occurs and causes a loss of AFW flow indication, loss of AFW pump, or loss of PCV-1139 indication from the CCR, the licensee stated that OMA #11 is

available to restore this function by locally operating PCV-1139 to ensure a steam supply to the 32 AFW pump. If OMA #11 becomes necessary, the licensee stated that they have assumed a 4.5-minute diagnosis period and that the required time to perform the action is 17 minutes while the time available is 30 minutes, which provides 8.5 minutes of margin.

3.3.4.8 OMA #12 – Locally operate PCV-1310A and PCV-1310B to ensure steam supply to 32 AFW pump.

The licensee stated that OMA #12 is only required if the 32 AFW pump is selected as the credited pump. The licensee also stated that the anticipated fire is a slow developing cable fire located in the cable trays.

In the event that a fire occurs and causes a loss of steam supply as diagnosed during local operation of the 32 AFW pump, the licensee stated that OMA #12 is available to restore this function by locally operating PCV-1310A and 1310B to ensure a steam supply to the 32 AFW pump. If OMA #12 becomes necessary, the licensee stated that they have assumed a 4.5-minute diagnosis period and that the required time to perform the action is 17 minutes while the time available is 30 minutes, which provides 8.5 minutes of margin.

3.3.4.9 OMA #13 – Locally manually perform SW pump strainer backwash, as required.

In an inspection report dated July 11, 2011 (ML111920339), NRC inspectors identified that this OMA was inappropriate because it was too complex and beyond the limited scope of an OMA to achieve and maintain post-fire hot shutdown. Therefore, the NRC staff finds that it is inappropriate to approve this OMA.

3.3.5 Conclusion for Fire Area ETN-4{1} (Fire Zone 60A)

The NRC staff had previously issued exemptions for Fire Zone 60A in 1987 (ML003779008) and in 1984 (ML003779284). In those exemptions, the NRC staff found that the fire detection system, the automatic fire suppression system, and the distance between redundant trains would provide reasonable assurance that one train of shutdown equipment

would be available following a fire in this fire zone. The NRC staff finds the defense-in-depth features in this fire zone and the available time margin would allow the use of OMA #7.

However, based on new information in the current submittal the NRC staff finds that OMA #6 is equivalent to implementing an alternate safe shutdown system in accordance with III.G.3 and does not qualify for a III.G.2 exemption as requested by the licensee. Also, the previous exemption requests did not mention that OMA #13, SW pump strainer backwash, was needed for the safe shutdown of the plant. Based on the discussion in section 3.3.4.9, the NRC staff finds it inappropriate to approve OMA #13. Also, OMAs #5, 8, 9, 10, 11, and 12 have insufficient available time margin to allow for reliable performance considering the potential variables as discussed in NUREG-1852. Therefore, the NRC staff finds that an exemption from III.G.2 based on these OMAs cannot be granted for Fire Zone 60A.

3.4 Fire Area ETN-4{3} – Electrical Tunnels (Fire Zone 73A – Upper Electrical Penetration Area, Elevation 46'-0")

3.4.1 Fire Prevention

The licensee stated that the fire loading in this area is moderate and that the fixed combustibles are cable insulation and incidental materials and that there are no transient combustibles. The licensee also stated that the ignition sources in the area consist of cables, junction boxes, electrical cabinets, and a transformer.

3.4.2 Detection, Control, and Extinguishment

The licensee stated that Fire Zone 73A has an area-wide, automatic ionization smoke detection system installed that was designed and installed in accordance with NFPA 72E, 1974 Edition. The licensee also stated that Fire Zone 73A has a dry-pipe, preaction sprinkler fire suppression system installed in the cable trays that was designed and installed in accordance with NFPA 13, 1978 Edition and NFPA 15, 1977 Edition.

3.4.3 Preservation of Safe Shutdown Capability

The licensee stated that Fire Zone 73A has a ceiling height of approximately 17'-0" and an approximate floor area of 1,350 square feet. As discussed in Section 3.0 above, the licensee did not identify any separation between credited and redundant trains of equipment.

3.4.4 OMAs Credited for a Fire in Fire Area ETN-4{3} (Fire Zone 73A)

3.4.4.1 OMA #14 – Operate HCV-1118 manually to control 32 AFW pump.

The licensee stated that cable JBI-TA5 for valve HCV-1118 is located in Fire Zone 73A in a cable tray located approximately 13 to 14 feet above the floor. The licensee also stated that ignition sources located less than 20 feet horizontally from the cable consist of cables and eight electrical cabinets. According to the licensee, two of the electrical cabinets are separated from the cable by approximately 5.7 to 6.7 feet vertically and the remaining electrical cabinets are separated from the cable by approximately 5.3 feet horizontally. The licensee further stated that no cables associated with the 31 AFW pump, its flow control valves (FCV-406A, FCV-406B), or its power source (Bus 3A) are routed through this fire area, but that the protected instrumentation credited in this fire area for monitoring SG level is the instrumentation for the 33 SG and the 34 SG, which would make the 31 AFW pump an unsuitable choice if all level instrumentation for 31 and 32 SG has been rendered inoperable by fire damage. The licensee also stated that the anticipated fire is a slow developing cable fire located in the cable trays.

In the event that a fire occurs and causes a loss of the CCR control or indication for all AFW pumps, the licensee stated that OMA #14 is available to restore this function by manually operating HCV-1118 to control the 32 AFW pump. If OMA #14 becomes necessary, the licensee stated that they have assumed a 4.5-minute diagnosis period and that the required time to perform the action is 17 minutes while the time available is 30 minutes, which provides 8.5 minutes of margin.

3.4.4.2 OMA #15 – Locally operate PCV-1139 to ensure steam supply to 32 AFW pump.

The licensee stated that cable JB1-PT2/3 for valve PCV-1139 is located in Fire Zone 73A in a cable tray located approximately 13 to 14 feet above the floor. The licensee also stated that ignition sources located less than 20 feet horizontally from the cable consist of cables and eight electrical cabinets. According to the licensee, two of the electrical cabinets are separated from the cable by approximately 5.7 to 6.7 feet vertically and the remaining electrical cabinets are separated from the cable by approximately 5.3 feet horizontally. The licensee further stated that OMA #15 is only required if 32 AFW pump is selected as the credited pump and other OMAs related to the 31 AFW pump are unsuccessful. The licensee also stated that the anticipated fire is a slow developing cable fire located in the cable trays.

In the event that a fire occurs and causes a loss of AFW flow indication, loss of AFW pump, or loss of PCV-1139 indication from the CCR, the licensee stated that OMA #15 is available to restore this function by locally operating PCV-1139 to ensure steam supply to the 32 AFW pump. If OMA #15 becomes necessary, the licensee stated that they have assumed a 4.5-minute diagnosis period and that the required time to perform the action is 17 minutes while the time available is 30 minutes, which provides 8.5 minutes of margin.

3.4.4.3 OMA #16 – Locally operates PCV-1310A and PCV-1310B to ensure steam supply to 32 AFW pump.

The licensee stated that cables JB1-X02 and JB1-S99 for valves PCV-1310A and PCV-1310B are located in Fire Zone 73A. The licensee also stated that ignition sources located less than 20 feet horizontally from the cables consist of cables and eight electrical cabinets. According to the licensee, two of the electrical cabinets are separated from the cables by approximately 5.7 to 6.7 feet vertically and the remaining electrical cabinets are separated from the cables by approximately 5.3 feet horizontally.

The licensee also stated that cables JB1-XO2/1 and JB1-SZ6 for valves PCV-1310A and PCV-1310B are located in Fire Zone 73A in a cable tray located approximately 13 feet above the floor. The licensee also stated that ignition sources located less than 20 feet horizontally from the cables consist of cables and eight electrical cabinets. According to the licensee, three of the electrical cabinets are separated from the cables by at least 4 feet vertically, two electrical cabinets are separated from the cables by approximately 2.3 feet horizontally and 2.3 feet vertically, and the remaining three electrical cabinets are separated from the cables by approximately 10.2 feet horizontally. The licensee further stated that OMA #16 is only required if the 32 AFW pump is selected as the credited pump. The licensee also stated that the anticipated fire is a slow developing cable fire located in the cable trays.

In the event that a fire occurs and causes a loss of steam supply as diagnosed during local operation of the 32 AFW pump, the licensee stated that OMA #16 is available to restore this function by locally operating PCV-1310A and 1310B to ensure steam supply to the 32 AFW pump. If OMA #16 becomes necessary, the licensee stated that they have assumed a 4.5-minute diagnosis period and that the required time to perform the action is 17 minutes while the time available is 30 minutes, which provides 8.5 minutes of margin.

3.4.4.4 OMA #17 – Locally operate FCV-405B, FCV-405D, or FCV-406B to control AFW flow to steam generators.

The licensee stated that cables JB1-KV8 and JB1-KV7 for valves FCV-405C and FCV-405D are located in Fire Zone 73A in a cable tray located approximately 13 to 14 feet above the floor. The licensee also stated that ignition sources located less than 20 feet horizontally from the cables consist of cables and eight electrical cabinets. According to the licensee, two of the electrical cabinets are separated from the cables by approximately 5.7 to 6.7 feet vertically and the remaining electrical cabinets are separated from the cables by approximately 5.3 feet

horizontally. The licensee further stated that the postulated fire scenario would involve a fire that causes damage to the cables serving the AFW FCVs in the area.

In the event that a fire occurs and causes a loss of the CCR control or indication for all AFW flow control valves, the licensee stated that OMA #17 is available to restore this function by locally operating FCV-405B, FCV-405D, or FCV-406B to control AFW flow to the steam generators. If OMA #17 becomes necessary, the licensee stated that they have assumed a 4.5-minute diagnosis period and that the required time to perform the action is 17 minutes while the time available is 30 minutes, which provides 8.5 minutes of margin.

3.4.5 Conclusion for Fire Area ETN-4{3} (Fire Zone 73A)

The NRC staff had previously issued exemptions for Fire Zone 73A in 1987 (ML003779008) and in 1984 (ML003779284). In those exemptions, the NRC staff found that the fire detection system, the automatic fire suppression system, the distance between redundant trains, and the use of the alternate safe shutdown system would provide reasonable assurance that one train of shutdown equipment would be available following a fire in this fire zone. In the current exemption request the licensee did not credit the alternate safe shutdown system, but instead proposed certain OMAs. The NRC staff finds that OMAs #14, 15, 16, and 17 have insufficient available time margin to allow for reliable performance considering the potential variables as discussed in NUREG-1852. Therefore, the NRC staff finds that an exemption from III.G.2 based on these OMAs cannot be granted for Fire Zone 73A.

3.5 Fire Area PAB-2{3} – Primary Auxiliary Building (Fire Zone 6 – 32 Charging Pump Room, Elevation 55'-0")

3.5.1 Fire Prevention

The licensee stated that the fire loading in this area is moderate and that the fixed combustibles are cable insulation, lube oil, and incidental materials and that transient combustibles consist of lube oil, solvent, grease, cleaning materials, wood, anti-contamination

clothing (anti-C's), and plastic. The licensee also stated that the ignition sources in the area consist of cables, a junction box, an electrical cabinet, a motor, and a pump.

3.5.2 Detection, Control, and Extinguishment

The licensee stated that Fire Zone 6 has an area-wide, automatic ionization smoke detection system installed that was designed and installed in accordance with NFPA 72E, 1974 Edition but that Fire Zone 6 does not have an automatic fire suppression system installed.

3.5.3 Preservation of Safe Shutdown Capability

The licensee stated that Fire Zone 6 has a ceiling height of approximately 16'-0" and an approximate floor area of 288 square feet. As discussed in Section 3.0 above, the licensee did not identify any separation between credited and redundant trains of equipment.

3.5.4 OMAs Credited for a Fire in Fire Area PAB-2{3} (Fire Zone 6)

3.5.4.1 OMA #18 – Locally close LCV-112C and open valve 288 to align charging pump suction path to RWST.

The licensee stated that cable DD4-VN3 for valve LCV-112C is located in Fire Zone 6 in conduit located approximately 14 feet above the floor and terminates at LCV-112B, which is located approximately 7.5 feet above the floor. The licensee also stated that ignition sources located less than 20 feet horizontally from the cable consist of cables, the charging pump motor, and a transfer switch. According to the licensee, the motor is separated from the cable by approximately 13.8 feet horizontally and the transfer switch is separated from the cable by approximately 16 feet horizontally.

The licensee also stated that cable DD4-VN3 is an interlock cable that interfaces with RWST outlet valve LCV-112B and that fire-induced failures of this cable could cause the spurious closure of LCV-112C. In addition, the licensee stated that preemptive steps in 3-ONOP-FP-1 to secure the 31 and 32 charging pumps early in the fire scenario will trigger action via 3-AOP-SSD-1 to locally verify charging pump suction path and perform OMA #18 prior to

starting a charging pump. 3-AOP-CVCS-1 provides guidance to be followed in the event that the swap of charging pump suction to the RWST cannot be confirmed (i.e., loss of CCR indication for valves LCV-112C or LCV-112B), which will also trigger OMA #18.

In the event that a fire occurs and causes a loss of the CCR control or indication for valves LCV-112C or LCV-112B, the licensee stated that OMA #18 is available to restore this function by locally closing LCV-112C and opening valve 288 to align the charging pump suction path to RWST. If OMA #18 becomes necessary, the licensee stated that they have assumed a 60-minute period before re-entering the fire area, an 11-minute diagnosis period, which is assumed to transpire during the 60-minute waiting period, and that the required time to perform the action is 11 minutes while the time available is 75 minutes, which provides 4 minutes of margin.

3.5.5 Conclusion for Fire Area PAB-2{3} (Fire Zone 6)

Although there is 4 minutes of margin available for OMA #18, Fire Zone 6 has moderate combustible loading, lacks automatic fire suppression, and the licensee did not provide details regarding any discernable separation between the credited and redundant equipment so it is not clear that at least one train of equipment would remain free of fire damage during or following a fire event. The NRC staff finds that OMA #18 has insufficient available time margin to allow for reliable performance considering the potential variables as discussed in NUREG-1852. Therefore, the NRC staff finds that the defense-in-depth is insufficient to demonstrate reasonable assurance that safe shutdown can be achieved for a fire in Fire Zone 6 and finds that OMA #18 is unacceptable for the purpose of providing the level of protection intended by the regulation and that an exemption from III.G.2 based on OMA #18 cannot be granted for Fire Zone 6.

3.6 Fire Area PAB-2{5} – Primary Auxiliary Building (Fire Zone 17A – Elevation 55'-0", PAB Corridor)

3.6.1 Fire Prevention

The licensee stated that the fire loading in this area is low and that the fixed combustibles are cable insulation, incidental materials, cellulose, resin, hydrogen, rubber, and plastic and that transient combustibles consist of solvent, lube oil, cleaning materials, grease, paper, wood, anti-C's, and plastic. The licensee also stated that the ignition sources in the area consist of cables, junction boxes, motor control centers (MCCs), transformers, a water heater, lighting power supply, an instrument panel, and electrical cabinets.

3.6.2 Detection, Control, and Extinguishment

The licensee stated that Fire Zone 17A has ionization smoke detectors installed in the under-floor area at MCC Nos. 36A, 36B, and 37 and ultraviolet detectors in the MCC area but that Fire Zone 17A does not have an automatic fire suppression system installed. The licensee also stated that the fire detection systems were designed and installed in accordance with NFPA 72E, 1974 Edition.

3.6.3 Preservation of Safe Shutdown Capability

The licensee stated that Fire Zone 17A has a ceiling height of approximately 16'-0" and an approximate floor area of 6,386 square feet. The licensee also stated that there are fire barriers, in the form of marine boards, installed over the cable trays.

The licensee stated that cable DD4-VN3 for valve LCV-112C is located in Fire Zone 17A in a tray located approximately 14 feet above the floor. The licensee also stated that ignition sources located less than 20 feet horizontally from the cable consist of cables, MCC panels, lighting power panels, electrical cabinets, and instrument panels. According to the licensee, the MCCs and lighting power panels are separated from the cable by approximately 7.4 feet

horizontally, three electrical cabinets are located under the cable separated by approximately 3.5 feet vertically, and the rest of the electrical cabinets are separated from the cabinet by approximately 5.6 feet horizontally. The licensee also stated that cable DD4-VN3 is an interlock cable that interfaces with RWST outlet valve LCV-112B and that fire-induced failures of this cable could cause the spurious closure of LCV-112C.

The licensee also stated that cables DD4-VN5/1 and DD4-VN5/2 for valve LCV-112C are located in Fire Zone 17A in a tray located approximately 14 feet above the floor. The licensee also stated that ignition sources located less than 20 feet horizontally from the cable consist of cables, MCC panels, lighting power panels, electrical cabinets, and instrument panels. According to the licensee, the MCCs and lighting power panels are separated from the cables by approximately 7.4 feet horizontally, three electrical cabinets are located under the cables separated by approximately 3.5 feet vertically, and the rest of the electrical cabinets are separated from the cables by approximately 5.6 to 10 feet horizontally.

The licensee also stated that cables AH9-PL2 and JA4-PL2/2 for the 32 charging pump are located in Fire Zone 17A in a tray located approximately 10 to 12 feet above the floor. The licensee also stated that ignition sources located less than 20 feet horizontally from the cable consist of cables, an instrument panel, 21 electrical cabinets, and one dry transformer. According to the licensee, the instrument panel and 12 of the electrical cabinets are located under the cables separated from the cables by approximately 4.2 feet vertically, the remaining 9 electrical cabinets are separated from the cables by approximately 4.2 feet horizontally, and the dry transformer is separated from the cables by approximately 15.8 feet horizontally.

As discussed in Section 3.0 above, the licensee did not identify any separation between credited and redundant trains of equipment.

3.6.4 OMAs Credited for a Fire in Fire Area PAB-2{5} (Fire Zone 17A)

3.6.4.1 OMA #19 – Locally close supply breaker for 32 charging pump.

In the event that a fire occurs and causes a failure of the CCR control switch response, or indicating lights prompt operators to investigate breaker status at the switchgear, the licensee stated that OMA #19 is available to restore this function by locally closing the supply breaker for the 32 charging pump. The supply breaker is located in a different fire area. If OMA #19 becomes necessary, the licensee stated that they have assumed a 30-minute diagnosis period and that the required time to perform the action is 7 minutes while the time available is 75 minutes, which provides 38 minutes of margin.

3.6.4.2 OMA #20 – Locally control 32 charging pump using scoop tube positioner.

In the event that a fire occurs and causes damage to the cables serving both the 31 and 32 charging pumps or causes a loss of CCR pump control or pump status indication, the licensee stated that OMA #20 is available to restore this function by locally controlling the 32 charging pump using the scoop tube positioner. If OMA #20 becomes necessary, the licensee stated that they have assumed a 30-minute diagnosis period and that the required time to perform the action is 9 minutes while the time available is 75 minutes, which provides 36 minutes of margin.

3.6.4.3 OMA #22 – Locally close LCV-112C and open bypass valve 288 to establish flowpath from RWST to charging pump suction.

The licensee stated that preemptive steps in procedure 3-ONOP-FP-1 to secure the 31 and 32 charging pumps early in the fire scenario will trigger action via 3-AOP-SSD-1 to locally verify charging pump suction path and perform OMA #22 prior to starting a charging pump. 3-AOP-CVCS-1 provides guidance to be followed in the event that swap of charging pump suction

to RWST cannot be confirmed (i.e., loss of CCR indication for valves LCV-112C or LCV-112B), which will also trigger OMA #22.

In the event that a fire occurs and causes a loss of the CCR control or indication for valves LCV-112C or LCV-112B, the licensee stated that OMA #22 is available to restore this function by locally closing LCV-112C and open bypass valve 288 to establish a flowpath from the RWST to the charging pump suction. If OMA #22 becomes necessary, the licensee stated that they have assumed a 60-minute period before re-entering the fire area, a 30-minute diagnosis period, which is assumed to transpire during the 60-minute waiting period and that the required time to perform the action is 11 minutes while the time available is 75 minutes, which provides 4 minutes of margin.

3.6.5 Conclusion for Fire Area PAB-2{5} (Fire Zone 17A)

There are 38 minutes of margin and 36 minutes of margin available for OMAs #19 and #20, respectively, automatic fire detection systems installed, and these two particular OMAs have sufficient time margin available. The staff finds that there is adequate defense-in-depth to support the use of OMAs #19 and #20 for Fire Zone 17A and that OMAs #19 and #20 are acceptable for this fire zone.

Although there is 4 minutes of margin available for OMA #22, Fire Zone 17A lacks automatic fire suppression, and the licensee did not provide details regarding any discernable separation between the credited and redundant equipment so it is not clear that at least one train of equipment would remain free of fire damage during or following a fire event. The NRC staff finds that OMA #22 has insufficient available time margin to allow for reliable performance considering the potential variables as discussed in NUREG-1852. Therefore, the NRC staff finds that the defense-in-depth is insufficient to demonstrate reasonable assurance that safe shutdown can be achieved for a fire in Fire Zone 17A and finds that an exemption from III.G.2 based on OMA #22 cannot be granted for Fire Zone 17A. The NRC previously granted an

exemption for Fire Zone 17A dated January 7, 1987 (ML003779008), but that exemption also credited the use of the IP3 alternate safe shutdown system. The IP3 alternate safe shutdown system was not evaluated here as the licensee only requested consideration for the OMAs.

3.7 Fire Area PAB-2{5} – Primary Auxiliary Building (Fire Zone 19A – Waste Evaporator Room, Elevation 55'-0")

3.7.1 Fire Prevention

The licensee stated that the fire loading in this area is low and that the fixed combustibles are cable insulation and incidental materials and that transient combustibles consist of wood, anti-C's, and plastic. The licensee also stated that the ignition sources in the area consist of cables, a junction box, transformers, and electrical cabinets.

3.7.2 Detection, Control, and Extinguishment

The licensee stated that Fire Zone 19A does not have a fire detection or automatic fire suppression system installed.

3.7.3 Preservation of Safe Shutdown Capability

The licensee stated that Fire Zone 19A has a ceiling height of approximately 16'-0" and an approximate floor area of 602 square feet. The licensee stated that cables AH9-PL2 and JA4-PL2/2 for the 32 charging pump are located in Fire Zone 19A in conduit located approximately 10 to 12 feet above the floor. The licensee also stated that ignition sources located less than 20 feet horizontally from the cable consist of cables, an instrument panel, 21 electrical cabinets, and a dry transformer. According to the licensee, the instrument panel and 12 of the electrical cabinets are located under the cables separated from the cables by approximately 4.2 feet vertically, the remaining 9 electrical cabinets are separated from the cables by approximately 4.2 feet horizontally, and the dry transformer is separated from the cables by approximately 15.8 feet horizontally.

As discussed in Section 3.0 above, the licensee did not identify any separation between credited and redundant trains of equipment.

3.7.4 OMAs Credited for a Fire in Fire Area PAB-2{5} (Fire Zone 19A)

3.7.4.1 OMA #19 – Locally close supply breaker for 32 charging pump.

In the event that a fire occurs and causes a failure of the CCR control switch response or indicating lights prompt operators to investigate breaker status at the switchgear, the licensee stated that OMA #19 is available to restore this function by locally closing the supply breaker for the 32 charging pump. The supply breaker is located in a different fire area. If OMA #19 becomes necessary, the licensee stated that they have assumed a 30-minute diagnosis period and that the required time to perform the action is 7 minutes while the time available is 75 minutes, which provides 38 minutes of margin.

3.7.4.2 OMA #20 – Locally control 32 charging pump using scoop tube positioner.

In the event that a fire occurs and causes damage to the cables serving both the 31 and 32 charging pumps or causes a loss of CCR pump control or pump status indication, the licensee stated that OMA #20 is available to restore this function by locally controlling the 32 charging pump using the scoop tube positioner. If OMA #20 becomes necessary, the licensee stated that they have assumed a 30-minute diagnosis period and that the required time to perform the action is 9 minutes while the time available is 75 minutes, which provides 36 minutes of margin.

3.7.5 Conclusion for Fire Area PAB-2{5} (Fire Zone 19A)

Although there is 38 minutes of margin and 36 minutes of margin available for OMAs #19 and #20, respectively, Fire Zone 19A lacks fire detection and automatic suppression systems and the licensee did not provide details regarding any discernable separation between the credited and redundant equipment and clear and direct procedures that instruct operators to proactively perform the OMAs, so it is not clear that at least one train of equipment would

remain free of fire damage during or following a fire event. Therefore, the NRC staff finds that the defense-in-depth is insufficient to demonstrate reasonable assurance that safe shutdown can be achieved for a fire in Fire Zone 19A and finds that an exemption from III.G.2 based on OMAs #19 and #20 cannot be granted for Fire Zone 19A.

3.8 Fire Area PAB-2{5} – Primary Auxiliary Building (Fire Zone 20A – Sample Room, Elevation 55'-0")

3.8.1 Fire Prevention

The licensee stated that the fire loading in this area is moderate and that the fixed combustibles are cable insulation and incidental materials and that transient combustibles consist of wood, solvent, cleaning materials, anti-C's, and plastic. The licensee also stated that the ignition sources in the area consist of cables and junction boxes.

3.8.2 Detection, Control, and Extinguishment

The licensee stated that Fire Zone 20A does not have a fire detection or automatic suppression system installed.

3.8.3 Preservation of Safe Shutdown Capability

The licensee stated that Fire Zone 20A has a ceiling height of approximately 14'-6" and an approximate floor area of 210 square feet. As discussed in Section 3.0 above, the licensee did not identify any separation between credited and redundant trains of equipment.

3.8.4 OMAs Credited for a Fire in Fire Area PAB-2{5} (Fire Zone 20A)

3.8.4.1 OMA #22 – Locally close LCV-112C and open bypass valve 288 to establish flowpath from RWST to charging pump suction.

The licensee did not describe which SSD cables are routed through Fire Zone 20A. The licensee stated that preemptive steps in procedure 3-ONOP-FP-1 to secure the 31 and 32 charging pumps early in the fire scenario will trigger action via 3-AOP-SSD-1 to locally verify charging pump suction path and perform OMA #22 prior to starting a charging pump. 3-AOP-

CVCS-1 provides guidance to be followed in the event that swap of charging pump suction to RWST cannot be confirmed (i.e., loss of CCR indication for valves LCV-112C or LCV-112B), which will also trigger OMA #22.

In the event that a fire occurs and causes a loss of the CCR control or indication for valves LCV-112C or LCV-112B, the licensee stated that OMA #22 is available to restore this function by locally closing LCV-112C and open bypass valve 288 to establish a flowpath from the RWST to the charging pump suction. If OMA #22 becomes necessary, the licensee stated that they have assumed a 60-minute period before re-entering the fire area, a 30-minute diagnosis period, which is assumed to transpire during the 60-minute waiting period and that the required time to perform the action is 11 minutes while the time available is 75 minutes, which provides 4 minutes of margin.

3.8.5 Conclusion for Fire Area PAB-2 (Fire Zone 20A)

Although there is 4 minutes of margin available for OMA #22, Fire Zone 20A lacks automatic fire detection and suppression systems and the licensee did not provide details regarding any discernable separation between the credited and redundant equipment so it is not clear that at least one train of equipment would remain free of fire damage during or following a fire event. The NRC staff finds that OMA #22 has insufficient available time margin to allow for reliable performance considering the potential variables as discussed in NUREG-1852.

Therefore, the NRC staff finds that the defense-in-depth is insufficient to demonstrate reasonable assurance that safe shutdown can be achieved for a fire in Fire Zone 20A and finds that an exemption from III.G.2 based on OMA #22 cannot be granted for Fire Zone 20A.

3.9 Fire Area PAB-2{5} – Primary Auxiliary Building (Fire Zone 27A – Elevation 73'-0" PAB Corridor)

3.9.1 Fire Prevention

The licensee stated that the fire loading in this area is low and that the fixed combustibles are cable insulation, incidental materials, cellulose, plastic, and a flammable liquid locker and that transient combustibles consist of lube oil, grease, paper, wood, solvent, cleaning materials, anti-C's, and plastic. The licensee also stated that the ignition sources in the area consist of cables, a transformer, a water heater, and junction boxes.

3.9.2 Detection, Control, and Extinguishment

The licensee stated that Fire Zone 27A does not have a fire detection or automatic suppression system installed.

3.9.3 Preservation of Safe Shutdown Capability

The licensee stated that Fire Zone 27A has a ceiling height of approximately 15'-6" and an approximate floor area of 5,532 square feet. The licensee stated that cables DD4-VN5/1 and DD4-VN5/2 for valve LCV-112C are located in Fire Zone 27A in a conduit or tray located approximately 12 feet above the floor. The licensee also stated that ignition sources located less than 20 feet horizontally from the cable consist of cables, electrical cabinets, and a dry transformer. According to the licensee, one of the electrical cabinets is located under the cables separated from the cables by approximately 6.8 feet vertically, the remaining electrical cabinets are separated from the cables by approximately 11.9 feet horizontally, and the dry transformer is located under the cables separated from the cables by approximately 3.5 feet vertically. As discussed in Section 3.0 above, the licensee did not identify any separation between credited and redundant trains of equipment.

3.9.4 OMAs Credited for a Fire in Fire Area PAB-2{5} (Fire Zone 27A)

3.9.4.1 OMA #22 – Locally close LCV-112C and open bypass valve 288 to establish flowpath from RWST to charging pump suction.

The licensee stated that preemptive steps in procedure 3-ONOP-FP-1 to secure the 31 and 32 charging pumps early in the fire scenario will trigger action via 3-AOP-SSD-1 to locally

verify charging pump suction path and perform OMA #22 prior to starting a charging pump. 3-AOP-CVCS-1 provides guidance to be followed in the event that swap of charging pump suction to RWST cannot be confirmed (i.e., loss of CCR indication for valves LCV-112C or LCV-112B), which will also trigger OMA #22.

In the event that a fire occurs and causes a loss of the CCR control or indication for valves LCV-112C or LCV-112B, the licensee stated that OMA #22 is available to restore this function by locally closing LCV-112C and open bypass valve 288 to establish a flowpath from the RWST to the charging pump suction. If OMA #22 becomes necessary, the licensee stated that they have assumed a 60-minute period before re-entering the fire area, a 30-minute diagnosis period, which is assumed to transpire during the 60-minute waiting period and that the required time to perform the action is 11 minutes while the time available is 75 minutes, which provides 4 minutes of margin.

3.9.5 Conclusion for Fire Area PAB-2{5} (Fire Zone 27A)

Although there is 4 minutes of margin available for OMA #22, Fire Zone 27A lacks fire detection and automatic suppression systems and the licensee did not provide details regarding any discernable separation between the credited and redundant equipment so it is not clear that at least one train of equipment would remain free of fire damage during or following a fire event. The NRC staff finds that OMA #22 has insufficient available time margin to allow for reliable performance considering the potential variables as discussed in NUREG-1852. Therefore, the NRC staff finds that the defense-in-depth is insufficient to demonstrate reasonable assurance that safe shutdown can be achieved for a fire in Fire Zone 27A and finds that an exemption from III.G.2 based on OMA #22 cannot be granted for Fire Zone 27A.

3.10 Fire Area PAB-2{5} – Primary Auxiliary Building (Fire Zone 30A – Valve Corridor, Elevation 73'-0")

3.10.1 Fire Prevention

The licensee stated that the fire loading in this area is moderate and that the fixed combustibles are cable insulation and incidental materials and that transient combustibles consist of lube oil, grease, wood, solvent, cleaning materials, anti-C's, and plastic. The licensee also stated that the ignition sources in the area consist of cables.

3.10.2 Detection, Control, and Extinguishment

The licensee stated that Fire Zone 30A does not have a fire detection or automatic suppression system installed.

3.10.3 Preservation of Safe Shutdown Capability

The licensee stated that Fire Zone 30A has a ceiling height of approximately 17'-0" and an approximate floor area of 171 square feet. The licensee stated that cables DD4-VN5/1 and DD4-VN5/2 for valve LCV-112C are located in Fire Zone 30A in a conduit or tray located approximately 2.5 to 12 feet above the floor. The licensee also stated that ignition sources located less than 20 feet horizontally from the cable consist of cables, electrical cabinets, and a dry transformer. According to the licensee, the electrical cabinets are separated from the cables by approximately 1.8 feet horizontally and the dry transformer is located under the cables separated from the cables by approximately 0.1 feet horizontally. As discussed in Section 3.0 above, the licensee did not identify any separation between credited and redundant trains of equipment.

3.10.4 OMAs Credited for a Fire in Fire Area PAB-2{5} (Fire Zone 30A)

3.10.4.1 OMA #22 – Locally close LCV-112C and open bypass valve 288 to establish flowpath from RWST to charging pump suction.

The licensee stated that preemptive steps in procedure 3-ONOP-FP-1 to secure the 31 and 32 charging pumps early in the fire scenario will trigger action via 3-AOP-SSD-1 to locally verify charging pump suction path and perform OMA #22 prior to starting a charging pump. 3-AOP-CVCS-1 provides guidance to be followed in the event that swap of charging pump suction

to RWST cannot be confirmed (i.e., loss of CCR indication for valves LCV-112C or LCV-112B), which will also trigger OMA #22.

In the event that a fire occurs and causes a loss of the CCR control or indication for valves LCV-112C or LCV-112B, the licensee stated that OMA #22 is available to restore this function by locally closing LCV-112C and open bypass valve 288 to establish a flowpath from the RWST to the charging pump suction. If OMA #22 becomes necessary, the licensee stated that they have assumed a 60-minute period before re-entering the fire area, a 30-minute diagnosis period, which is assumed to transpire during the 60-minute waiting period and that the required time to perform the action is 11 minutes while the time available is 75 minutes, which provides 4 minutes of margin.

3.10.5 Conclusion for Fire Area PAB-2{5} (Fire Zone 30A)

Although there is 4 minutes of margin available for OMA #22, Fire Zone 30A has moderate combustible fuel loading, lacks fire detection and automatic suppression systems and the licensee did not provide details regarding any discernable separation between the credited and redundant equipment so it is not clear that at least one train of equipment would remain free of fire damage during or following a fire event. The NRC staff finds that OMA #22 has insufficient available time margin to allow for reliable performance considering the potential variables as discussed in NUREG-1852. Therefore, the NRC staff finds that the defense-in-depth is insufficient to demonstrate reasonable assurance that safe shutdown can be achieved for a fire in Fire Zone 30A and finds that an exemption from III.G.2 based on OMA #22 cannot be granted for Fire Zone 30A.

3.11 Fire Area PAB-2{5} – Primary Auxiliary Building (Fire Zone 58A – Piping Tunnel, Elevation 41'-0")

3.11.1 Fire Prevention

The licensee stated that the fire loading in this area is low and that the fixed combustibles are cable insulation and incidental materials and that transient combustibles consist of lube oil, grease, wood, solvent, cleaning materials, anti-C's, and plastic. The licensee also stated that the ignition sources in the area consist of cables.

3.11.2 Detection, Control, and Extinguishment

The licensee stated that Fire Zone 58A has an area-wide, ionization smoke detection system designed and installed in accordance with NFPA 72E, 1974 Edition but does not have an automatic fire suppression system installed.

3.11.3 Preservation of Safe Shutdown Capability

The licensee stated that Fire Zone 58A has a ceiling height of approximately 10'-0" to 12'-0" and an approximate floor area of 1,400 square feet. The licensee stated that cable K1B-W1B for the 32 charging pump is located in Fire Zone 58A in a tray located approximately 9.5 feet above the floor. The licensee also stated that other than cables, there are no ignition sources located less than 20 feet from the cable. As discussed in Section 3.0 above, the licensee did not identify any separation between credited and redundant trains of equipment.

3.11.4 OMAs Credited for a Fire in Fire Area PAB-2{5} (Fire Zone 58A)

3.11.4.1 OMA #19 – Locally close supply breaker for 32 charging pump.

In the event that a fire occurs and causes a failure of the CCR control switch response, or indicating lights prompt operators to investigate breaker status at the switchgear, the licensee stated that OMA #19 is available to restore this function by locally closing the supply breaker for the 32 charging pump. The supply breaker is located in a different fire area. If OMA #19 becomes necessary, the licensee stated that they have assumed a 30-minute diagnosis period and that the required time to perform the action is 7 minutes while the time available is 75 minutes, which provides 38 minutes of margin.

3.11.4.2 OMA #20 – Locally control 32 charging pump using scoop tube positioner.

In the event that a fire occurs and causes damage to the cables serving both the 31 and 32 charging pumps or causes a loss of CCR pump control or pump status indication, the licensee stated that OMA #20 is available to restore this function by locally controlling the 32 charging pump using the scoop tube positioner. If OMA #20 becomes necessary, the licensee stated that they have assumed a 30-minute diagnosis period and that the required time to perform the action is 9 minutes while the time available is 75 minutes, which provides 36 minutes of margin.

3.11.5 Conclusion for Fire Area PAB-2{5} (Fire Zone 58A)

Since there is 38 minutes of margin and 36 minutes of margin available for OMAs #19 and #20, respectively, an automatic smoke detection system installed, and these two particular OMAs have sufficient margin available, the staff finds that there is adequate defense-in-depth to support the use of OMAs #19 and #20 for Fire Zone 58A and that OMAs #19 and #20 are acceptable for the purpose of providing the level of protection intended by the regulation and that an exemption from III.G.2 based on these OMAs is granted for Fire Zone 58A.

3.12 Fire Area PAB-2{5} – Primary Auxiliary Building (Fire Zone 59A – Pipe Penetration Area, Elevation 41'-0" and 51'-0" of the Fan House)

3.12.1 Fire Prevention

The licensee stated that the fire loading in this area is low and that the fixed combustibles are cable insulation and incidental materials and that transient combustibles consist of grease, wood, cleaning materials, anti-C's, and plastic. The licensee also stated that the ignition sources in the area consist of cables and a junction box.

3.12.2 Detection, Control, and Extinguishment

The licensee stated that Fire Zone 59A has an area-wide, ionization smoke detection system designed and installed in accordance with NFPA 72E, 1974 Edition but does not have an automatic fire suppression system installed.

3.12.3 Preservation of Safe Shutdown Capability

The licensee stated that Fire Zone 59A has a ceiling height of approximately 8'-0" to 26'-0" and an approximate floor area of 3,782 square feet. The licensee stated that cables JB5-X1J and VK4-X1J for valve HCV-142 are located in Fire Zone 59A in a tray located approximately 6 to 26 feet above the floor. The licensee also stated that ignition sources located less than 20 feet horizontally from the cable consist of cables, an electrical cabinet, and 8 motors attached to motor-operated valves. According to the licensee, the electrical cabinet is located under the cables separated from the cables by approximately 2.6 feet vertically and the motors are separated from the cables by approximately 2.1 feet horizontally and no vertical separation. As discussed in Section 3.0 above, the licensee did not identify any separation between credited and redundant trains of equipment.

3.12.4 OMAs Credited for a Fire in Fire Area PAB-2{5} (Fire Zone 59A)

3.12.4. 1OMA #21 – Open bypass valve 227 to establish charging flow path to RCS around potentially failed close HCV-142.

In the event that a fire occurs and causes normal flowpath valve HCV-142 to close, the licensee stated that OMA #21 is available to restore this function by opening bypass valve 227 to establish a charging flowpath to the RCS around the potentially failed close HCV-142. If OMA #21 becomes necessary, the licensee stated that they have assumed a 60-minute period before re-entering the fire area, a 30-minute diagnosis period, which is assumed to transpire during the 60-minute waiting period and that the required time to perform the action is 9 minutes while the time available is 75 minutes, which provides 6 minutes of margin.

3.12.5 Conclusion for Fire Area PAB-2{5} (Fire Zone 59A)

Although there is 6 minutes of margin available for OMA #21, this OMA requires the operator to re-enter the fire area after the fire has been extinguished. Fire Zone 59A contains

credible fire scenarios, lacks automatic fire suppression, and the licensee did not provide details regarding any discernable separation between the credited and redundant equipment and clear and direct procedures that instruct operators to proactively perform the OMA so it is not clear that at least one train of equipment would remain free of fire damage during or following a fire event. The NRC staff finds that OMA #21 has insufficient available time margin to allow for reliable performance considering the potential variables as discussed in NUREG-1852.

Therefore, the NRC staff finds that the defense-in-depth is insufficient to demonstrate reasonable assurance that safe shutdown can be achieved for a fire in Fire Zone 59A and finds that an exemption from III.G.2 based on this OMA cannot be granted for Fire Zone 59A.

3.13 Fire Area TBL-5 – Turbine Building (Fire Zone 37A – Ground Floor South, Elevation 15'-0")

3.13.1 Fire Prevention

The licensee stated that the fire loading in this area is low and that the fixed combustibles are cable insulation, MCC switchgear, cellulose, plastic, lube oil, and a flammable liquid cabinet and that there are no transient combustibles. The licensee also stated that the ignition sources in the area consist of cables, a junction box, a battery with charger, electrical cabinets, transformers, a dryer, 6.9 kV switchgear vertical panels (potential high energy arcing fault (HEAF) source), and MCC vertical panels.

3.13.2 Detection, Control, and Extinguishment

The licensee stated that Fire Zone 37A has ionization smoke detectors installed over MCC 34 and over the 6.9 kV switchgear, thermal detection in the battery and charger room, a wet-pipe sprinkler system installed throughout the area except over switchgear, and a wet pipe sprinkler system installed throughout the battery and charger room. The licensee also stated that the detection systems were designed and installed in accordance with NFPA 72E, 1974

Edition and the fire suppression systems were designed and installed in accordance with NFPA 13, 1983 Edition.

3.13.3 Preservation of Safe Shutdown Capability

The licensee stated that Fire Zone 37A has a ceiling height of approximately 119'-0" (See TABLE RAI-GEN-15 of the licensee's May 4, 2010, letter, ML101320263) and an approximate floor area of 5,838 square feet. The licensee stated that cable AQ7-WF6 for the 31 SW strainer is routed through Fire Zone 37A in a tray located approximately 11.3 feet above the floor. The licensee also stated that ignition sources located less than 20 feet horizontally from the cable consist of cables, an MCC, 6.9 kV switchgear, and an electrical cabinet. According to the licensee, the MCC and 6.9 kV switchgear are located under the cable separated by approximately 3 feet vertically and the electrical cabinet is separated from the cable by approximately 8.1 feet horizontally. As discussed in Section 3.0 above, the licensee did not identify any separation between credited and redundant trains of equipment.

3.13.4 OMAs Credited for a Fire in Fire Area TBL-5 (Fire Zone 37A)

3.13.4.1 OMA #25 – Locally manually backwash SW pump strainer, as required, if power to strainer associated with selected SW pump is lost.

The licensee stated that the need to periodically backwash a selected SW strainer is variable depending on ultimate heat sink conditions and other factors and that the diagnostic indicator to perform the OMA is based on operator rounds monitoring pressure across SW strainers. The licensee also stated that the anticipated fire is a slow developing cable fire located in the cable trays.

In the event that a fire occurs and causes an increase in SW pump strainer differential pressure or a loss of power to the strainer associated with the selected SW pump, the licensee stated that OMA #25 is available to restore this function by locally manually performing a SW pump strainer backwash. In an inspection report dated July 11, 2011 (ML111920339), NRC

inspectors identified that this OMA was inappropriate because it was too complex and beyond the limited scope of an OMA to achieve and maintain post-fire hot shutdown. Therefore, the NRC staff finds that it is inappropriate to approve this OMA.

3.13.5 Conclusion for Fire Area TBL-5 (Fire Zone 37A)

The NRC staff finds that the defense-in-depth is insufficient to demonstrate reasonable assurance that safe shutdown can be achieved for a fire in Fire Zone 37A and finds that OMA #25 is unacceptable for the purpose of providing the level of protection intended by the regulation and that an exemption from III.G.2 based on this OMA cannot be granted for Fire Zone 37A.

3.14 Fire Area TBL-5 – Turbine Building (Fire Zone 38A – Chemical Laboratory, Elevation 15'-0")

3.14.1 Fire Prevention

The licensee stated that the fire loading in this area is low and that the fixed combustibles are cable insulation, an MCC, cellulose, plastic, hydrogen, chemicals, and a flammable liquid cabinet and that there are no transient combustibles. The licensee also stated that the ignition sources in the area consist of an electrical cabinet and an MCC.

3.14.2 Detection, Control, and Extinguishment

The licensee stated that Fire Zone 38A has an ionization smoke detector installed over MCC 32 and a wet-pipe sprinkler suppression system installed in the chemical storage area. The licensee also stated that the detection system was designed and installed in accordance with NFPA 72E, 1974 Edition and the fire suppression system was designed and installed in accordance with NFPA 13, 1983 Edition.

3.14.3 Preservation of Safe Shutdown Capability

The licensee stated that Fire Zone 38A has a ceiling height of approximately 8'-0" and an approximate floor area of 4,500 square feet. The licensee stated that cables AQ7-WF6 and

WF6-Z99 for the 31 SW strainer are routed through Fire Zone 38A in a tray or conduit that traverses the area vertically. The licensee also stated that ignition sources located less than 20 feet horizontally from the cables consist of cables and 2 electrical cabinets. According to the licensee, the electrical cabinets are separated from the cables by approximately 11.8 feet horizontally. The licensee further stated that the need to periodically backwash a selected SW strainer is variable depending on ultimate heat sink conditions and other factors and that the diagnostic indicator to perform the OMA is based on operator rounds monitoring pressure across SW strainers. The licensee also stated that the anticipated fire is a slow developing cable fire located in the cable trays. As discussed in Section 3.0 above, the licensee did not identify any separation between credited and redundant trains of equipment.

3.14.4 OMAs Credited for a Fire in Fire Area TBL-5 (Fire Zone 38A)

3.14.4.1 OMA #25 – Locally manually backwash SW pump strainer, as required, if power to strainer associated with selected SW pump is lost.

The licensee stated that the need to periodically backwash a selected SW strainer is variable depending on ultimate heat sink conditions and other factors and that the diagnostic indicator to perform the OMA is based on operator rounds monitoring pressure across SW strainers.

In the event that a fire occurs and causes an increase in SW pump strainer differential pressure or a loss of power to the strainer associated with the selected SW pump, the licensee stated that OMA #25 is available to restore this function by locally manually performing a SW pump strainer backwash. In an inspection report dated July 11, 2011 (ML111920339), NRC inspectors identified that this OMA was inappropriate because it was too complex and beyond the limited scope of an OMA to achieve and maintain post-fire hot shutdown. Therefore, the NRC staff finds that it is inappropriate to approve this OMA.

3.14.5 Conclusion for Fire Area TBL-5 (Fire Zone 38A)

The NRC staff finds that the defense-in-depth is insufficient to demonstrate reasonable assurance that safe shutdown can be achieved for a fire in Fire Zone 37A and finds that OMA #25 is unacceptable for the purpose of providing the level of protection intended by the regulation and that an exemption from III.G.2 based on this OMA cannot be granted for Fire Zone 38A.

3.15 Fire Area TBL-5 – Turbine Building (Fire Zone 43A – South End, Elevation 36'-9")

3.15.1 Fire Prevention

The licensee stated that the fire loading in this area is low and that the fixed combustibles are paper, MCC switchgear, rubber, wood, plastic, cable insulation, and incident materials and that transient combustibles consist of lube oil, solvent, grease, cleaning materials, and wood. The licensee also stated that the ignition sources in the area consist of cables, *junction boxes, exciter switchgear, transformers, and electrical cabinets.*

3.15.2 Detection, Control, and Extinguishment

The licensee stated that Fire Zone 43A has an automatic wet-pipe sprinkler system installed throughout the zone but does not have an automatic fire detection system installed. The licensee also stated that the fire suppression system was designed and installed in accordance with NFPA 13, 1983 Edition.

3.15.3 Preservation of Safe Shutdown Capability

The licensee stated that Fire Zone 43A has a ceiling height of approximately 97'-0" (See TABLE RAI-GEN-17 of the licensee's May 4, 2010 letter, ML101320263) and an approximate floor area of 7,725 square feet. The licensee stated that cable AQ7-WF6 for the 31 SW strainer is routed through Fire Zone 43A in a tray located approximately 7.4 feet above the floor. The licensee also stated that ignition sources located less than 20 feet horizontally from the cable

consist of cables and 2 electrical cabinets. According to the licensee, the electrical cabinets are separated from the cable by approximately 1 foot horizontally. The licensee also stated that the anticipated fire is a slow developing cable fire located in the cable trays. As discussed in Section 3.0 above, the licensee did not identify any separation between credited and redundant trains of equipment.

3.15.4 OMAs Credited for a Fire in Fire Area TBL-5 (Fire Zone 43A)

3.15.4.1 OMA #25 – Locally manually backwash SW pump strainer, as required, if power to strainer associated with selected SW pump is lost.

The licensee stated that the need to periodically backwash a selected SW strainer is variable depending on ultimate heat sink conditions and other factors and that the diagnostic indicator to perform the OMA is based on operator rounds monitoring pressure across SW strainers.

In the event that a fire occurs and causes an increase in SW pump strainer differential pressure or a loss of power to the strainer associated with the selected SW pump, the licensee stated that OMA #25 is available to restore this function by locally manually performing a SW pump strainer backwash. In an inspection report dated July 11, 2011 (ML111920339), NRC inspectors identified that this OMA was inappropriate because it was too complex and beyond the limited scope of an OMA to achieve and maintain post-fire hot shutdown. Therefore, the NRC staff finds that it is inappropriate to approve this OMA.

3.15.5 Conclusion for Fire Area TBL-5 (Fire Zone 43A)

Although Fire Zone 43A has an automatic wet-pipe sprinkler system installed, OMA #25 is not acceptable, Fire Zone 43A lacks automatic fire detection, and the licensee did not provide details regarding any discernable separation between the credited and redundant equipment, and clear and direct procedures that instruct operators to proactively perform the OMAs, so it is not clear that at least one train of equipment would remain free of fire damage during or

following a fire event. Therefore, the NRC staff finds that the defense-in-depth is insufficient to demonstrate reasonable assurance that safe shutdown can be achieved for a fire in Fire Zone 43A and finds that OMA #25 is unacceptable for the purpose of providing the level of protection intended by the regulation and that an exemption from III.G.2 based on this OMA cannot be granted for Fire Zone 43A.

3.16 Fire Area TBL-5 – Turbine Building (Fire Zone 44A – South End of Heater Bay, Elevation 36'-9")

3.16.1 Fire Prevention

The licensee stated that the fire loading in this area is low and that the fixed combustibles are a flammable liquid cabinet, cellulose, rubber, wood, plastic, cable insulation, and incident materials and that transient combustibles consist of lube oil, solvent, grease, cleaning materials, and wood. The licensee also stated that the ignition sources in the area consist of cables, junction boxes, a dry transformer, and electrical cabinets.

3.16.2 Detection, Control, and Extinguishment

The licensee stated that Fire Zone 44A does not have a fire detection or automatic suppression system installed.

3.16.3 Preservation of Safe Shutdown Capability

The licensee stated that Fire Zone 44A has a ceiling height of approximately 29'-0" and an approximate floor area of 5,625 square feet. The licensee stated that cable AQ7-WF6 for the 31 SW strainer is routed through Fire Zone 44A in a tray located approximately 7.4 feet above the floor. The licensee also stated that ignition sources located less than 20 feet horizontally from the cable consist of cables, an MCC, 6.9 kV switchgear, and electrical cabinets. The licensee also stated that the anticipated fire is a slow developing cable fire located in the cable trays. As discussed in Section 3.0 above, the licensee did not identify any separation between credited and redundant trains of equipment.

3.16.4 OMAs Credited for a Fire in Fire Area TBL-5 (Fire Zone 44A)

3.16.4.1 OMA #25 – Locally manually backwash SW pump strainer, as required, if power to strainer associated with selected SW pump is lost.

The licensee stated that the need to periodically backwash a selected SW strainer is variable depending on ultimate heat sink conditions and other factors and that the diagnostic indicator to perform the OMA is based on operator rounds monitoring pressure across SW strainers.

In the event that a fire occurs and causes an increase in SW pump strainer differential pressure or a loss of power to the strainer associated with the selected SW pump, the licensee stated that OMA #25 is available to restore this function by locally manually performing a SW pump strainer backwash. In an inspection report dated July 11, 2011 (ML111920339), NRC inspectors identified that this OMA was inappropriate because it was too complex and beyond the limited scope of an OMA to achieve and maintain post-fire hot shutdown. Therefore, the *NRC staff finds that it is inappropriate to approve this OMA.*

3.16.5 Conclusion for Fire Area TBL-5 (Fire Zone 44A)

Since OMA #25 is unacceptable and Fire Zone 44A lacks fire detection and automatic suppression and the licensee did not provide details regarding any discernable separation between the credited and redundant equipment and clear and direct procedures that instruct operators to proactively perform the OMA, it is not clear that at least one train of equipment would remain free of fire damage during or following a fire event. Therefore, the NRC staff finds that the defense-in-depth is insufficient to demonstrate reasonable assurance that safe shutdown can be achieved for a fire in Fire Zone 44A and finds that OMA #25 is unacceptable for the purpose of providing the level of protection intended by the regulation and that an exemption from III.G.2 based on this OMA cannot be granted for Fire Zone 44A.

3.17 Fire Area TBL-5 – Turbine Building (Fire Zone 52A – Chemical Addition Area, Elevation 32'-6" of AFW Bldg)

3.17.1 Fire Prevention

The licensee stated that the fire loading in this area is low and that the fixed combustibles are cable insulation, cellulose barrels, and rubber hose and that transient combustibles consist of lube oil, solvent, grease, cleaning materials, and wood. The licensee also stated that the ignition sources in the area consist of motors, compressors, and a water heater.

3.17.2 Detection, Control, and Extinguishment

The licensee stated that Fire Zone 52A does not have a fire detection or automatic suppression system installed.

3.17.3 Preservation of Safe Shutdown Capability

The licensee stated that Fire Zone 52A has a ceiling height of approximately 8'-6" and an approximate floor area of 1,254 square feet. The licensee stated that cable JB1-X32/1 for valve FCV-1121 (recirculation flow for the 31 AFW pump) is located in Fire Zone 52A in rigid steel conduit. The licensee also stated that ignition sources located less than 20 feet horizontally from the cable consist of cables, 2 motors, and 2 electrical cabinets. According to the licensee, the motors are separated from the cable by approximately 13.2 feet horizontally and the two electrical cabinets are separated from the cable by approximately 6.3 feet horizontally.

The licensee stated that cable K45-YM3 for valves FCV-406A and FCV-406B (31 AFW pump discharge to 31 SG and 32 SG) is located in Fire Zone 52A in rigid steel conduit. The licensee also stated that ignition sources located less than 20 feet horizontally from the cables consist of cables, 2 motors, and 2 electrical cabinets. According to the licensee, the motors are

separated from the cables by approximately 13.2 feet horizontally and the two electrical cabinets are separated from the cables by approximately 6.3 feet horizontally.

As discussed in Section 3.0 above, the licensee did not identify any separation between credited and redundant trains of equipment.

3.17.4 OMAs Credited for a Fire in Fire Area TBL-5 (Fire Zone 52A)

3.17.4.1 OMA #23 – Locally operate bypass valve for FCV-1121 AFW pump recirculation valve during pump startup.

If a fire were to occur and cause a loss of CCR control or indication of FCV-1121 or cause the valve to close and all AFW flow control valves FCV-406A through 406D fail closed, the licensee stated that OMA #23 is available to restore this function by locally operating the bypass valve for FCV-1121 during pump startup. If OMA #23 becomes necessary, the licensee stated that they have assumed a 4.5-minute diagnosis period and that the required time to perform the action is 8 minutes while the time available is 30 minutes, which provides 17.5 minutes of margin.

3.17.4.2 OMA #24 – Locally operate FCV-406A and 406B to control AFW flow to SGs.

If a fire were to occur and cause a loss of CCR control or indication of FCV-1121 or cause the valve to close and all AFW flow control valves FCV-406A through 406D fail closed, the licensee stated that OMA #24 is available to restore this function by locally operating valves FCV-406A and FCV-406B to control AFW flow to the SGs. If OMA #24 becomes necessary, the licensee stated that they have assumed a 4.5-minute diagnosis period and that the required time to perform the action is 17 minutes while the time available is 30 minutes, which provides 8.5 minutes of margin.

3.17.5 Conclusion for Fire Area TBL-5 (Fire Zone 52A)

Although there is 17.5 minutes of margin and 8.5 minutes of margin available for OMAs #23 and #24, respectively, Fire Zone 52A lacks fire detection and automatic suppression, and

the licensee did not provide details regarding any discernable separation between the credited and redundant equipment and clear and direct procedures that instruct operators to proactively perform the OMAs so it is not clear that at least one train of equipment would remain free of fire damage during or following a fire event. The NRC staff finds that OMA #24 has insufficient available time margin to allow for reliable performance considering the potential variables as discussed in NUREG-1852. Therefore, the NRC staff finds that the defense-in-depth is insufficient to demonstrate reasonable assurance that safe shutdown can be achieved for a fire in Fire Zone 52A and finds that an exemption from III.G.2 based on these OMAs cannot be granted for Fire Zone 52A.

3.18 Fire Area TBL-5 – Turbine Building (Fire Zone 54A – Main Boiler Feedwater Regulator Area, Elevation 18'-6" of AFW Bldg)

3.18.1 Fire Prevention

The licensee stated that the fire loading in this area is low and that the fixed combustibles are cable insulation, incidental material, and a flammable liquid cabinet and that transient combustibles consist of lube oil, solvent, grease, cleaning materials, and wood. The licensee also stated that the ignition sources in the area consist of cables, motors, junction boxes, and an electrical cabinet.

3.18.2 Detection, Control, and Extinguishment

The licensee stated that Fire Zone 54A does not have a fire detection or automatic suppression system installed.

3.18.3 Preservation of Safe Shutdown Capability

The licensee stated that Fire Zone 54A has a ceiling height of approximately 70' and an approximate floor area of 1,088 square feet. The licensee stated that cable K45-YM3 for valves FCV-406A and FCV-406B are located in Fire Zone 54A in rigid steel conduit. As discussed in

Section 3.0 above, the licensee did not identify any separation between credited and redundant trains of equipment.

3.18.4 OMAs Credited for a Fire in Fire Area TBL-5 (Fire Zone 54A)

3.18.4.1 OMA #24 – Locally operate FCV-406A and 406B to control AFW flow to SGs.

If a fire were to occur and cause a loss of CCR control or indication of FCV-1121 or cause the valve to close and all AFW flow control valves FCV-406A through 406D fail closed, the licensee stated that OMA #24 is available to restore this function by locally operating valves FCV-406A and FCV-406B to control AFW flow to the SGs. If OMA #24 becomes necessary, the licensee stated that they have assumed a 4.5-minute diagnosis period and that the required time to perform the action is 17 minutes while the time available is 30 minutes, which provides 8.5 minutes of margin.

3.18.5 Conclusion for Fire Area TBL-5 (Fire Zone 54A)

Although there is 8.5 minutes of margin available for OMA #24, Fire Zone 54A lacks fire detection and automatic fire suppression, and the licensee did not provide details regarding any discernable separation between the credited and redundant equipment and clear and direct procedures that instruct operators to proactively perform the OMAs so it is not clear that at least one train of equipment would remain free of fire damage during or following a fire event. The NRC staff finds that OMA #24 has insufficient available time margin to allow for reliable performance considering the potential variables as discussed in NUREG-1852. Therefore, the NRC staff finds that the defense-in-depth is insufficient to demonstrate reasonable assurance that safe shutdown can be achieved for a fire in Fire Zone 54A and finds that an exemption from III.G.2 based on this OMA cannot be granted for Fire Zone 54A.

3.19 Fire Area YARD-7 – Exterior Yard (Fire Zone 22 – Screenwell Area)

3.19.1 Fire Prevention

The licensee stated that the fire loading in this area is low and that the fixed combustibles are cable insulation, MCC switchgear, plastic, and incidental materials and that transient combustibles consist of lube oil, solvent, grease, cleaning materials, and wood. The licensee also stated that the ignition sources in the area consist of cables, a junction box, a transformer, motors, pumps, and an electrical cabinet.

3.19.2 Detection, Control, and Extinguishment

The licensee stated that Fire Zone 22 has an area-wide, photoelectric smoke detection system that was designed and installed in accordance with NFPA 72E, 1987 Edition but does not have an automatic fire suppression system installed.

3.19.3 Preservation of Safe Shutdown Capability

The licensee stated that Fire Zone 22 has an approximate floor area of 784 square feet. Service water pumps 31, 32, 33, 34, 35, and 36, pump discharge strainers 31-36, and their power cables are located in the metal enclosure that comprises this fire zone. Backup service water pumps 37, 38, and 39 are located over 100 feet away on the plant discharge canal with negligible fixed combustibles between the two groups of pumps. Although it is unlikely due to the low fire loading, a fire in this fire zone could potentially disable service water pumps 31-36, which would render the three emergency diesel generators inoperable due to lack of cooling water, along with other safe shutdown equipment that requires cooling water. The licensee stated that in the case of a loss of offsite power in conjunction with the fire in Fire Zone 22, they could perform an OMA to start the ARDG and energize backup service water pump 38 to provide cooling water as needed. As discussed in Section 3.0 above, the licensee did not identify any separation between credited and redundant trains of equipment.

3.19.4 OMAs Credited for a Fire in Fire Area YARD-7 (Fire Zone 22)

3.19.4.1 OMA #26 – Locally start ARDG to supply MCC 312A in support of the use of SW pump 38.

In the event that a fire occurs and causes a loss of CCR control or indication for all SW pumps, the licensee stated that OMA #26 is available to restore this function by locally starting the ARDG (which is air-cooled) to supply MCC 312A in order to energize the 38 service water pump. If OMA #26 becomes necessary, the licensee stated that they have assumed a less than 1-minute diagnosis period and that the required time to perform the action is 25 minutes while the time available is greater than 60 minutes, which provides 35 minutes of margin. The NRC staff notes that this is equivalent to implementing an alternate safe shutdown system in accordance with III.G.3 and does not qualify for a III.G.2 exemption.

3.19.4.2 OMA #27 – Locally manually backwash SW pump strainer, as required, if power to strainer associated with selected SW pump is lost.

The licensee stated that the need to periodically backwash a selected SW strainer is variable depending on ultimate heat sink conditions and other factors and that the diagnostic indicator to perform the OMA is based on operator rounds monitoring pressure across SW strainers.

In the event that a fire occurs and causes an increase in SW pump strainer differential pressure or a loss of power to the strainer associated with the selected SW pump, the licensee stated that OMA #25 is available to restore this function by locally manually performing a SW pump strainer backwash. In an inspection report dated July 11, 2011 (ML111920339), NRC inspectors identified that this OMA was inappropriate because it was too complex and beyond the limited scope of an OMA to achieve and maintain post-fire hot shutdown. Therefore, the NRC staff finds that it is inappropriate to approve this OMA.

3.19.5 Conclusion for Fire Area YARD-7 (Fire Zone 22)

Since OMA #26 is a III.G.3 solution which does not qualify for a III.G.2 exemption, and the NRC staff has determined that OMA #27 is an inappropriate OMA, and Fire Zone 22 lacks automatic fire suppression and the licensee did not provide details regarding any discernable

separation between the credited and redundant equipment, it is not clear that at least one train of equipment would remain free of fire damage during or following a fire event. Therefore, the NRC staff finds that the defense-in-depth is insufficient to demonstrate reasonable assurance that safe shutdown can be achieved for a fire in Fire Zone 22 and finds that an exemption from III.G.2 based on these OMAs cannot be granted for Fire Zone 22. The NRC previously granted an exemption for Fire Zone 22 dated January 7, 1987 (ML003779008), but that exemption was primarily associated with the use of the IP3 Alternate Safe Shutdown System. The IP3 Alternate Safe Shutdown System was not evaluated here as the licensee only requested consideration for the OMAs.

3.20 Fire Area YARD-7 – Exterior Yard (Fire Zone 222 – Backup Service Water Pit)

3.20.1 Fire Prevention

The licensee stated that the fire loading in this area is low and that the fixed combustibles are cable insulation and that there are no transient combustibles. The licensee also stated that the ignition sources in the area consist of motors and pumps.

3.20.2 Detection, Control, and Extinguishment

The licensee stated that Fire Zone 222 does not have a fire detection or automatic fire suppression system installed.

3.20.3 Preservation of Safe Shutdown Capability

The licensee stated that Fire Zone 222 is an open outdoor area. The licensee stated that cables C2B-XD6 and C2B-XD6/1 for the 38 SW pump are routed through Fire Zone 222 in conduit located approximately 13 feet above the floor. The licensee also stated that ignition sources located less than 20 feet horizontally from the cables consist of cables and a temporary yard power station. According to the licensee, the temporary yard power station is separated from the cables by approximately 18 feet horizontally.

The licensee also stated that cables MY1-PY1 and PY1-XV2 for the 38 SW strainer are routed through Fire Zone 222. The licensee also stated that ignition sources located less than 20 feet horizontally from the cables consist of cables and three motors. According to the licensee, the motors are separated from the cables by approximately 13.2 feet horizontally.

As discussed in Section 3.0 above, the licensee did not identify any separation between credited and redundant trains of equipment.

3.20.4 OMAs Credited for a Fire in Fire Area YARD-7 (Fire Zone 222)

3.20.4.1 OMA #27 – Locally manually backwash SW pump strainer, as required, if power to strainer associated with selected SW pump is lost.

The licensee stated that the need to periodically backwash a selected SW strainer is variable depending on ultimate heat sink conditions and other factors and that the diagnostic indicator to perform the OMA is based on operator rounds monitoring pressure across SW strainers.

In the event that a fire occurs and causes an increase in SW pump strainer differential pressure or a loss of power to the strainer associated with the selected SW pump, the licensee stated that OMA #25 is available to restore this function by locally manually performing a SW pump strainer backwash. In an inspection report dated July 11, 2011 (ML111920339), NRC inspectors identified that this OMA was inappropriate because it was too complex and beyond the limited scope of an OMA to achieve and maintain post-fire hot shutdown. Therefore, the NRC staff finds that it is inappropriate to approve this OMA.

3.20.5 Conclusion for Fire Area YARD-7 (Fire Zone 222)

Since Fire Zone 222 lacks fire detection and automatic suppression and the licensee did not provide details regarding any discernable separation between the credited and redundant equipment, it is not clear that at least one train of equipment would remain free of fire damage during or following a fire event. The NRC staff has also found that the use of OMA #27 is

inappropriate. Therefore, the NRC staff finds that the defense-in-depth is insufficient to demonstrate reasonable assurance that safe shutdown can be achieved for a fire in Fire Zone 222 and finds that OMA #27 is unacceptable for the purpose of providing the level of protection intended by the regulation and that an exemption from III.G.2 based on this OMA cannot be granted for Fire Zone 222.

4.0 Feasibility and Reliability of the Operator Manual Actions

Based on Section 3.0 above, several areas where OMAs are credited were found acceptable. The OMAs credited in those areas were then evaluated for feasibility and reliability. This analysis postulates that OMAs may be necessary to assure SSD capability in addition to the traditional fire protection features described above. NUREG-1852, "Demonstrating the Feasibility and Reliability of Operator Manual Actions in Response to Fire," provides criteria and associated technical bases for evaluating the feasibility and reliability of post-fire OMAs in nuclear power plants. The following provides the licensee's justification for the OMAs specified in this exemption.

4.1 Bases for Establishing Feasibility

The licensee's analysis addresses factors such as environmental concerns, equipment functionality and accessibility, available indications, communications, portable equipment, personnel protection equipment, procedures and training, and staffing and demonstrations. In its submittals, the licensee stated that environmental factors such as radiation, lighting, temperature, humidity, smoke, toxic gas, noise, and fire suppression discharge were evaluated and found to not represent a negative impact on the operators' abilities to complete the OMAs. The licensee stated that normal radiation conditions within the areas of concern will not be adversely affected by the fire and subsequent spurious equipment operation. The licensee also confirmed that each of the OMA locations addressed by this exemption are provided with

emergency lighting that illuminates both the potential egress paths and the component requiring OMA manipulation.

The licensee also confirmed that temperature and humidity conditions will not challenge the operators performing the OMAs. Additionally, the licensee indicated that heat and smoke or gas generation from a fire will not impact the operator performing the OMAs. For those specific cases in which it is necessary to reenter the fire area no less than 1 hour after the postulated fire event, the licensee stated that sufficient time is available to initiate smoke/heat venting through fixed ventilation systems and augmented by portable smoke ejectors, consistent with the Pre-Fire Plans, to ensure operator habitability to implement the necessary OMAs. In addition, the licensee stated that pre-staged self-contained breathing apparatus (SCBA), sufficient to equip the full operating crew, are available for deployment in response to post-fire environmental conditions.

The licensee stated that equipment credited for implementation of OMAs was reviewed to ensure it is accessible, available, and not damaged by the affects of the fire. Where ladders are required for access to components to perform OMAs, appropriate ladders are staged in accordance with plant procedures and the presence of these ladders is verified periodically in accordance with plant surveillance procedures. Any tools that are required in support of post-fire hot shutdown OMAs are pre-staged at the locations where they would be used. These consist of common tools such as wrenches, banding cutters, and pliers. Where special tools/equipment are required, the licensee stated that they are designated for post-fire cold shutdown repairs, and the necessary tools and supplies are pre-staged in designated locations. The staging of necessary tools is confirmed via periodic surveillance.

In addition, the licensee indicates that procedures are in place, in the form of fire response procedures, to ensure that clear and accessible instructions on how to perform the manual actions are available to the operators. The licensee stated that all of the requested

OMAs are directed by plant procedures, and the operators are trained in the use of the procedures. Specifically, the licensee stated that post-fire operator manual actions are clearly defined in procedures 3-ONOP-FP-001 and 3-AOP-SSD-1. The OMAs required for the III.G.2 fire areas are directed by Off-Normal Operating Procedure 3-ONOP-FP-001. Where CCR controls and indications are not assured to be reliably operable, the licensee stated that sufficiently detailed guidance is provided in procedure 3-AOP-SSD-1 to direct the operators to an alternate component or operating method that is assured to be available and viable for the specific fire scenario under consideration. Initial and periodic requalification operator training is provided on these procedures, consistent with standard licensed and non-licensed operator training programs.

The licensee stated that key diagnostic instrumentation is expected to remain available in the CCR to alert operators to implement the contingency OMAs as credited in the IP3 Appendix R SSD Analysis. Key indicators that trigger the need for local operator intervention for the credited set of OMAs include not only the RCS and secondary system instrumentation, but also the failure of components to respond or reliably indicate status in the CCR. The licensee further stated that based on field notes compiled from simulator exercises in which bounding fire area scenarios were modeled, the available CCR instruments and indicators, combined with operator response in accordance with Emergency Operating Procedures (EOPs), AOPs, fire SSD procedures, and other supporting procedures, are sufficient to ensure timely diagnosis of conditions requiring the dispatch of operator(s) to perform the credited OMAs outside the CCR.

With regard to communications, the licensee stated that reliance is placed on radios for communication between plant operators during a post-fire shutdown event. Radio repeaters are located outside the protected area and are not subject to disruption caused by fire events within the protected area. The repeaters are also equipped with uninterruptible power supplies to ensure continued operation in the event of the loss of normal power to the buildings in which

they are located. Field verifications of radio system functionality have validated that communications between the designated control and monitoring locations are feasible and reliable.

The licensee stated that the manual action sequences in all of the Section III.G.2 areas are considered to be bounded by the sequences represented by alternate shutdown (Section III.G.3) Fire Area A. With regard to staffing, the licensee stated that timed field walkthroughs of Abnormal Operating Procedure 3-AOP-SSD-1 have been performed to validate that the number of operators available on the watch staff (7) can safely accomplish all required actions within the required time period to meet Appendix R SSD performance goals. The licensee stated that the broad set of operator manual actions required in implementing alternate shutdown procedure 3-AOP-SSD-1 bounds the smaller set of manual actions credited for coping with III.G.2 fire area scenarios and that most OMAs required for the III.G.2 fire areas are directed by Off-Normal Operating Procedure 3-ONOP-FP-001.

Additionally, the licensee stated that post-fire OMAs have been validated through timed operator walkthroughs, using as the basis an enveloping scenario addressed by 3-AOP-SSD-1. When utilizing 3-AOP-SSD-1, the most challenging set of local manual operator actions (number of actions and time sensitivity of actions) is presented to the operations shift crew, and this set of actions is considered to adequately bound the limited set of manual actions that are credited in 3-ONOP-FP-001. The licensee states that the timed walkthroughs of 3-AOP-SSD-1 have consistently demonstrated that the key SSD tasks (e.g., restoration of RCS makeup; restoration of AFW to SGs; mitigation of key potential spurious actuation concerns) can be accomplished in a timely manner to meet the Appendix R SSD performance goals. The licensee further states that in addition to the validation of key OMAs credited in alternate SSD procedure 3-AOP-SSD-1, the plant simulator was utilized to perform evaluations of bounding III.G.2 fire scenarios, and based on the field notes compiled from these exercises, there is

reasonable assurance that conditions requiring the implementation of the identified OMAs can be identified and mitigated in a sufficiently timely manner to ensure Appendix R performance goals are met.

4.2 *Feasibility*

The licensee's analysis demonstrates that, with exceptions, the OMAs can be diagnosed and executed within the amount of time available to complete them. The licensee's analysis also demonstrates that various factors, as discussed above, have been considered to address uncertainties in estimating the time available. The licensee stated that the credited OMAs have been demonstrated to be feasible through timed evolutions performed using a combination of simulator drills and dispatch of operators to simulate performance of the OMAs within the physical plant. In most cases, the OMAs are completed, with margin remaining, within the time constraints established by the supporting SSD thermal-hydraulic analyses. The licensee stated that the time values have been shown to be consistently achievable, and the operations resource demand required to support any one of the fire area scenarios is a fraction of the 7-operator complement available to support a PFSSD scenario.

The following table summarizes the "required time" versus "available time" for each OMA. The indicated "required time" is the time needed to complete all actions that may be required as a result of fire in each of the identified fire areas and includes diagnosis time, implementation time, and uncertainty time. The indicated "available time" is the time by which the action must be completed in order to meet the assumptions in plant analyses. The NRC staff finds that the required time to perform the actions is reasonable as the licensee has verified these times in simulator scenarios and by simulating performance in the plant. Where reentry to a fire area is required to perform an OMA, a 60-minute waiting period is also included in the required time and the diagnosis period for these instances was assumed to occur concurrent with the waiting period. Finally, the times noted below should be considered with the

understanding that the manual actions are a fall back in the unlikely event that the fire protection defense-in-depth features are insufficient.

Fire Area	Fire Zones ¹	OMA ID ²	OMA Summary	Required Time (min) ³	Available Time (min)	Available Margin (min)
AFW-6	23	1	Locally start 33 AFW Pump via operation of the Bus 6A circuit breaker.	17.5	30	12.5
ETN-4{1}	7A	2	Swap 32 Component Cooling Water (CCW) pump to alternate power supply or align city water to charging pumps.	34	>60	26
	7A	3	Operate 480V Bus 3A breaker locally to start 31 AFW pump.	11.5	30	18.5
	7A	4	Locally operate Flow Control Valve (FCV)-1121 in support of use of 31 AFW pump.	12.5	30	17.5
	60A	5	Operate HCV-1118 manually to control 32 AFW pump.	21.5	30	8.5 ⁴
	7A, 60A	6	Align Appendix R Diesel Generator (ARDG) to 480 V Buses 2A, 3A, 5A, and 312.	50	75	25 ⁵
	7A, 60A	7	Swap 31 or 32 charging pump to alternate power supply.	38	75	37
	7A, 60A	8	Locally operate FCV-405B, FCV-405D, or FCV-406B to control AFW flow to Steam Generators (SGs).	21.5	30	8.5 ⁴
	60A	9	Locally open valve 227 to establish charging [previously "CVCS"] makeup	69	75	6 ⁴

¹ Fire Areas are areas of fire origin; Indicated Fire Zones contain the cables or equipment whose damage due to fire may require implementation of the OMAs.

² Operator Action ID designators (1, 2, 3 etc.) were assigned by the NRR reviewer.

³ Total of simulator-based diagnosis was added to the field-based time to travel to the OMA location, complete the OMA, confirm the action, and notify the CCR of completion as well as the 60-minute waiting period as discussed above.

⁴ OMAs found to be feasible but unreliable.

⁵ OMAs associated with III.G.3

Fire Area	Fire Zones ¹	OMA ID ²	OMA Summary	Required Time (min) ³	Available Time (min)	Available Margin (min)
			flowpath to Reactor Coolant System (RCS).			
	60a	10	Locally close valve LCV-112C and open valve 288 to align charging pump suction to the Refueling Water Storage Tank (RWST).	71	75	4 ⁴
	60A	11	Locally operate PCV-1139 to ensure steam supply to 32 AFW pump.	21.5	30	8.5 ⁴
	60A	12	Locally operate PCV-1310A and PCV-1310B to ensure steam supply to 32 AFW pump.	21.5	30	8.5 ⁴
	60A	13	Locally manually perform Service Water (SW) pump strainer backwash as required.	>75	>60	not acceptable
ETN-4{3}	73A	14	Operate HCV-1118 manually to control 32 AFW pump.	21.5	30	8.5 ⁴
		15	Locally operate PCV-1139 to ensure steam supply to 32 AFW pump.	21.5	30	8.5 ⁴
		16	Locally operate 32 PCV-1310A, PCV-1310B to ensure steam supply to 32 AFW pump.	21.5	30	8.5 ⁴
		17	Locally operate FCV-405C and FCV-405D to control AFW flow to SG.	21.5	30	8.5 ⁴
PAB-2{3}	6	18	Locally close valve LCV-112C and open valve 228 to align charging pump suction path to RWST.	71	75	4 ⁴

Fire Area	Fire Zones ¹	OMA ID ²	OMA Summary	Required Time (min) ³	Available Time (min)	Available Margin (min)
PAB-2{5}	17A, 19A, 58A,	19	Locally close supply breaker for 32 Charging Pump [previously "CVCS"] Pump.	37	75	38
	17A, 19A, 58A	20	Locally control 32 charging [previously "CVCS"] pumps using scoop tube positioner.	39	75	36
	59A	21	Open bypass valve 227 to establish charging flowpath to RCS around potentially failed closed HCV-142.	69	75	6 ⁴
	17A, 20A, 27a, 30A	22	Locally Close LCV-112C and open bypass valve 288 to establish flowpath from RWST to charging pump suction.	71	75	4 ⁴
TBL-5	52A	23	Locally operate [bypass valve for] FCV-1121 AFW pump recirculation valve during pump startup.	12.5	30	17.5
	52A, 54A	24	Locally operate FCV- 406A and FCV-406B to control AFW flow to SGs.	21.5	30	8.5 ⁴
	37A, 38A, 43A, 44A	25	Locally/manually backwash SW pump strainer as required if power to strainer associated with selected SW pump is lost (use one of STR PMP-31 through STR PMP-36).	>75	>60	not acceptable
YARD-7	22	26	Locally start ARDG to supply Motor Control Center (MCC) 312A in support of the use of SW pump 38.	25	>60	>35 ⁵

Fire Area	Fire Zones ¹	OMA ID ²	OMA Summary	Required Time (min) ³	Available Time (min)	Available Margin (min)
	22, 222	27	Locally/manually backwash SW Pump strainer as required if power to strainer associated with selected SW pump is lost.	>75	>60	not acceptable

4.3 Reliability

As stated in NUREG-1852, for a feasible action to be performed reliably, it should be shown that there is adequate time available to account for uncertainties not only in estimates of the time available, but also in estimates of how long it takes to diagnose and execute the OMAs (e.g., as based, at least in part, on a plant demonstration of the action under non-fire conditions). To confirm reliability, for each fire area having the potential to initiate the need for an OMA, the licensee considered uncertainties associated with estimating how long it takes to diagnose and execute operator manual actions.

Where the licensee demonstrated that adequate margin was available, the required completion times noted in the table above provide reasonable assurance that the OMAs can reliably be performed under a wide range of conceivable conditions by different plant crews because the completion times, in conjunction with the available time margins associated with each action and other installed fire protection features, account for sources of uncertainty such as variations in fire and plant conditions, factors unable to be recreated in demonstrations and human-centered factors. As noted in the table above, several of the OMAs included in this review were found to be reliable because there is adequate time available to account for uncertainties not only in estimates of the time available, but also in estimates of how long it takes to diagnose a fire and execute the OMAs (e.g., as based, at least in part, on a plant demonstration of the actions under non-fire conditions). Other OMAs were determined to be

feasible but not reliable since only nominal margin is available to complete them. Those OMAs found to be feasible but unreliable are those indicated by footnote #4 to the table above.

4.4 *Summary of Defense-in-Depth and Operator Manual Actions*

In summary, the defense-in-depth concept for a fire in the fire areas included in the table below provides a level of safety that results in the unlikely occurrence of fires, rapid detection, control and extinguishment of fires that do occur and the protection of structures, systems and components important to safety. For these particular fire zones and the OMAs credited in them and found acceptable in Sections 3.0 and 4.0 above, the licensee has provided preventative and protective measures in addition to feasible and reliable OMAs that together demonstrate the licensee's ability to preserve or maintain SSD capability in the event of a fire in the analyzed fire areas. The remaining zones included in the licensee's request were found to provide an inadequate level of defense-in-depth or safety margin and as such the requested OMAs for these zones are not approved for permanent use. The table below summarizes which fire zones are granted exemptions from III.G.2.

Fire Zone	Area of Fire Origin	Exemption approved for this fire zone
23	AFW-6	Previous exemption remains valid
7A	ETN-4{1}	No
60A	ETN-4{1}	No
73A	ETN-4{3}	No
6	PAB-2{3}	No
17A	PAB-2{5}	No
19A	PAB-2{5}	No
20A	PAB-2{5}	No
27A	PAB-2{5}	No
30A	PAB-2{5}	No
58A	PAB-2{5}	Yes

59A	PAB-2{5}	No
37A	TBL-5	No
38A	TBL-5	No
43A	TBL-5	No
44A	TBL-5	No
52A	TBL-5	No
54A	TBL-5	No
22	YARD-7	No
222	YARD-7	No

4.5 Authorized by Law

This exemption would allow IP3 to rely on specific OMAs, as discussed in Sections 3.0 and 4.0 above, in conjunction with the other installed fire protection features, to ensure that at least one means of achieving and maintaining safe shutdown remains available during and following a postulated fire event, as part of its fire protection program, in lieu of meeting the requirements specified in III.G.2 for a fire in the analyzed fire areas. As stated above, 10 CFR 50.12 allows the NRC to grant exemptions from the requirements of 10 CFR Part 50. The NRC staff has determined that granting of this exemption will not result in a violation of the Atomic Energy Act of 1954, as amended, or the Commission's regulations. Therefore, the exemption is authorized by law.

4.6 No Undue Risk to Public Health and Safety

The underlying purpose of 10 CFR Part 50, Appendix R, Section III.G is to ensure that at least one means of achieving and maintaining safe shutdown remains available during and following a postulated fire event. Based on the above, no new accident precursors are created by the use of the specific OMAs, in conjunction with the other installed fire protection features, in response to a fire in the analyzed fire areas. Therefore, the probability of postulated accidents is not increased. Also based on the above, the consequences of postulated accidents are not increased. Therefore, there is no undue risk to public health and safety.

4.7 Consistent with Common Defense and Security

This exemption would allow IP3 to credit the use of the specific OMAs, in conjunction with the other installed fire protection features, in response to a fire in the analyzed fire areas, discussed above, in lieu of meeting the requirements specified in III.G.2. This change to the

operation of the plant has no relation to security issues. Therefore, the common defense and security is not diminished by this exemption.

4.8 *Special Circumstances*

One of the special circumstances described in 10 CFR 50.12(a)(2)(ii) is that the application of the regulation is not necessary to achieve the underlying purpose of the rule. The underlying purpose of 10 CFR Part 50, Appendix R, Section III.G is to ensure that at least one means of achieving and maintaining safe shutdown remains available during and following a postulated fire event. While the licensee does not comply with the explicit requirements of Section III.G.2, the approved OMAs, in conjunction with the other installed fire protection features, provide a method to ensure that a train of equipment necessary to achieve and maintain safe shutdown of the plant will be available in the event of a fire in these fire zones. The NRC staff concludes that application of the regulation is not necessary to achieve the underlying purpose of the rule for the plant configurations approved in this exemption. Therefore special circumstances exist, as required by 10 CFR 50.12(a)(2)(ii), that warrant the issuance of this exemption.

5.0 Conclusion

Based on all of the features of the defense-in-depth concept discussed for the fire zones listed in Section 4.4 of this exemption, the NRC staff concludes that the use of specific OMAs found acceptable in Sections 3.0 and 4.0 of this evaluation, in these particular instances and in conjunction with the other installed fire protection features, in lieu of strict compliance with the requirements of III.G.2, will allow IP3 to meet the underlying purpose of the rule for those fire zones. The use of other specific OMAs in certain fire zones were found to be not acceptable, as discussed in Sections 3.0 and 4.0 of this evaluation, and as such, are not approved by this exemption.

Accordingly, the Commission has determined that, pursuant to 10 CFR 50.12(a), the exemption is authorized by law, will not present an undue risk to the public health and safety, is consistent with the common defense and security and that special circumstances are present to warrant issuance of the exemption. Therefore, the Commission hereby grants Entergy an exemption from the requirements of Section III.G.2 of Appendix R of 10 CFR Part 50, to utilize the OMAs approved above at IP3.

Pursuant to 10 CFR 51.32, the Commission has determined that the granting of this exemption will not have a significant effect on the quality of the human environment (76 FR 74832).

This exemption is effective upon issuance.

Dated at Rockville, Maryland, this first day of February 2012.

FOR THE NUCLEAR REGULATORY COMMISSION

/RA/

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Office of Nuclear Reactor Regulation

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